

Power-to-Design Circuits



HyDraw[®] CAD⁸⁰⁰

“Power-to-Design” circuits



VEST, Inc. 3250 W, Big Beaver Road, Suite 440, Troy, MI 48084 USA

Tel: +1 248 649 9550 Email: sales@VESTusa.com Visit: www.VESTusa.com

VEST, Inc.

HyDraw® CAD⁸⁰⁰ Software Product License Agreement

Notice: Read this before installing the software.

Carefully read the terms and conditions of this agreement before opening the product package. Opening the package indicates your acceptance of these terms and conditions. If you do not agree with the terms and conditions of this Agreement, promptly return the package unopened to the place where you obtained it.

Definitions

The Software Product is licensed (not sold) to you. The Software product includes all copies of the Software Product and its related supporting materials.

License

VEST, Inc. (we, our, us) grants you a personal, non-transferable, and non-exclusive license to use the Software Product in the specified quantity only.

You may not:

1. distribute, sublicense or copy any portion of the Licensed Software product;
2. modify or prepare derivative works from the Licensed Software Product;
3. transmit the Licensed Software product electronically by any means; or
4. Use the Licensed Software product in multiple computer or multiple user arrangements unless that use is covered by individual license for each computer or user.

You agree that the Licensed Software product belongs to us and you agree to keep confidential and use your best efforts to prevent and protect the contents of the Licensed Software Product from unauthorized disclosure.

Limited

1. For 90 days from the date of shipment, we warrant that the media (for example, CD) on which the Licensed Software Product is contained will be free from defects in materials and workmanship. The warranty does not cover damage caused by viruses, improper use or neglect.

We do not warrant the contents of the Licensed Software Product (it is furnished "AS IS" and without warranty as to the performance or results you may obtain by using the Licensed Software Product) or that it will be error free.

2. You assume the entire risk as to the results and performance of the Licensed Software Product.

To get media warranty service during the 90-day warranty period, you may return the Product (postage paid) with a description of the problem to the place where you obtained it. The defective media on which the Licensed Software Product is contained will be replaced at no additional charge to you.

3. If you do not receive media that is free from defects in materials and workmanship during the 90-day warranty period, you will receive a refund or credit to your account for the amount you paid for the Licensed Software Product returned.

Disclaimer of Warranty

YOU UNDERSTAND AND AGREE AS FOLLOWS:

1. Warranties in this agreement replace all other warranties, express or implied, including any warranties of merchantability or fitness for a particular purpose. We disclaim and exclude all other warranties.
2. We will not be liable for any loss or damage caused by delay in furnishing a Licensed Software Product or any other performance under this Agreement.
3. Our entire liability and your exclusive remedies for our liability of any kind (including liability for negligence except liability for personal injury caused solely by our negligence) for the Licensed Software Product covered by the Agreement and all other performance or non-performance by us under or related to this Agreement are limited to the remedies specified by this Agreement.
4. In no event will our liability of any kind include any special incidental or consequential damages, even if we have knowledge of the potential loss or damage.
5. Special notice to consumers: some states do not allow the exclusion of implied warranties so the above exclusion may not apply to you. The warranty gives you special legal rights, and you may also have other rights, which vary from state to state.

Termination

This Agreement is effective until terminated. You may terminate it any time by destroying the Licensed Software Product. It will also terminate if you do not comply with any term or condition of this Agreement. You agree upon termination to destroy the Licensed Software Product.

General

You are responsible for installation, management and operation of the Licensed Software Product.

Contents

1. Introduction	1
2. Support.....	3

Workspace

3. HyDraw Startup	5
4. HyDraw CAD Ribbon Menu.....	6
5. HyDraw Library Explorer.....	7
6. HyDraw Property Manager.....	10
7. HyDraw Options	15

Insert Symbols.....

8. Insert Symbol.....	40
9. Insert External Port.....	43
10. Search Components	46
11. Search Sub-systems.....	52
12. Insert from Parts List	56
13. Insert Terminators	57
14. Insert Symbol Port	58
15. Insert Envelope.....	59
16. Insert Gauge Port	60

Make Connections.....

17. Insert Connection	62
18. Connect Ports and Symbols.....	63
19. Fetch Pipe and Tube Data.....	64

Modify Connection.....

20. Stretch Connections	66
21. Match Connections	67
22. Reset Connections	68

Specify Properties

23. Selected Item Properties	70
24. System Properties	77
25. Edit Properties.....	78
26. Copy Properties	79

27. Refresh Properties	80
28. Update Property List	81
29. Show/Hide Properties.....	82
30. Purge Properties	83
31. Purge Price Data.....	85
32. ERP Interface.....	86

Modify Symbols

33. Move Symbol	88
34. Align Symbols	89
35. Rotate Symbols	90
36. Flip Symbols	91
37. Align Symbol Ports	92
38. Align External Port Names.....	93
39. Edit Symbol Port.....	94
40. Edit in Place.....	95
41. Delete a Symbol	96
42. Stack Symbols	97
43. Show/Hide Port Names.....	98
44. Show/Hide Design Notes.....	99
45. Edit Design Notes	100
46. Edit Solenoid Information	101

Annotations

47. Change Text Height	103
48. Rotate Property Text.....	104
49. Reassign Item ID.....	105
50. Reassign Hose ID	106
51. Recreate Balloons	107
52. Add New Display Format.....	108

Lists.....

53. Create and Insert Parts List	110
54. Create and Insert Ports List	113
55. Create and Insert Hose List	115
56. Create Solenoid Actuation Chart.....	117

57. Create and Insert Net List	118
58. Create Design Note List.....	120

Collate Files.....

59. Collate Documents.....	122
60. Collate CAD Files	123

Calculator.....

61. Unit Converter	125
--------------------------	-----

MDTools Interface.....

62. Export to MDTools.....	127
----------------------------	-----

FluidPowerTools.com

63. Data Access Settings	129
64. Help for FluidPowerTools.com.....	130
65. Internet Settings	134

HyDraw CAD Help.....

66. Help	136
67. About HyDraw	137

Installation & Setup.....

68. HyDraw CAD ⁸⁰⁰ Installation	139
69. Library Network Configuration	149
70. Set Online Services (FPT)	150
71. Build New Symbols	152
72. Build New External Ports	158

1. Introduction

Welcome to VEST HyDraw® CAD⁸⁰⁰

Create accurate, error free, professionally drawn hydraulic circuits, parts lists, and quotations quickly and easily.

Drag-and-drop 'smart' symbols into a drawing with point-and-click component selection.

The 'smart' connection lines snap to ports and self-route with jumpers.

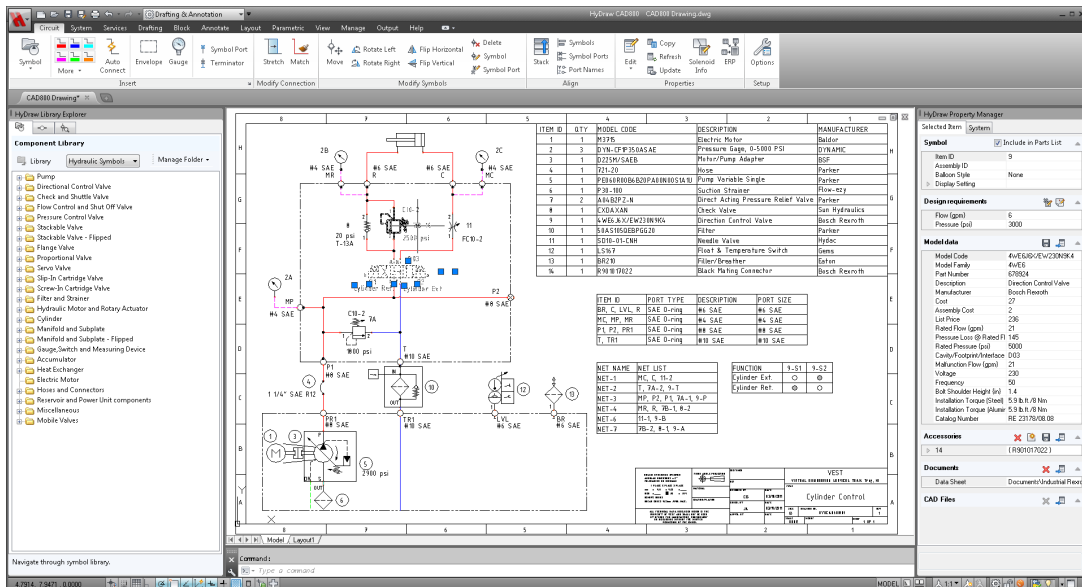
Auto BOM generation ensures accuracy of your Bill of Materials. Easily insert it into the circuit drawing, or export it to Microsoft Excel.

Get started with over 8,000 ISO 1219-1 compliant symbols covering both industrial and mobile hydraulics. 'Remember' your data and rules using HyDraw custom database. Ensure up-to-date pricing of components by linking your ERP data to HyDraw.

Circuit design data can be easily ported to downstream manifold design and CAM systems.

HyDraw can access manufacturer component data from FluidPowerTools.com, a fee-based service from VEST. Also, submit your circuit to QuickManifolds.com for 'instant' manifold design.

Use **HyDraw** and ensure your competitive edge.



HyDraw CAD drawing area with HyDraw CAD Ribbon menu, HyDraw Library Explorer, and HyDraw Property Manager

HyDraw[®] CAD⁸⁰⁰ is easy to use. It works seamlessly with its own ribbon menu. HyDraw symbols are located quickly by navigating logically structured menus. Sets of related symbols are shown together and any required symbol can be inserted into the drawing by drag and drop method or double click on a symbol. You can insert generic symbols or model code specific component symbols into the library. Edit parametric properties of the inserted symbols, when needed.

HyDraw Library

The HyDraw library accommodates a wide range of simple and complex graphical component symbols, and schematic diagrams covering both Industrial and Mobile Hydraulics. Designed in accordance with ISO1219-1:2012, Fluid Power Systems and Components - Graphic Symbols and Circuit Diagrams - Part 1: Graphic Symbols for Conventional Use and Data Processing Applications. A few percentile deviations from ISO standard necessitated keeping in view the large variants of symbols and customer base. The HyDraw library includes both Slip-in and Screw-in Cartridge valves and associated symbols for manifold design circuits.

Smart Symbols

HyDraw symbols are created using primitive shapes, such as lines, polylines, rectangles, squares, circles, circular arcs, ellipsis. They represent components with specified functions or method of operation in the de-energized (at rest) position, or component specific rule that do not have a clearly defined de-energized position. A pool of ISO specified primitive shapes are included in the library to help you design your own generic symbols. HyDraw symbols also include port identification and port numbering, which is essential for manifold design.

ISO guidelines

VEST has adhered to ISO guidelines of Module System (1Module = 2 Millimeter), where the symbol fits into a grid and presents a symmetry. The use of layer properties for assigning ISO defined color to Supply line, Return line, Pilot line, Drain line, Envelope line, and Flow direction exhibits appealing color graphics, which help in instant understanding of the operational aspect of the component. Layer properties are also utilized for naming ports, positions and solenoids. (both US and European pattern)

Search

The new and powerful HyDraw CAD⁸⁰⁰ Search from library command searches general or OEM specific symbols and circuits from www.FluidPowerTools.com, saving time and effort.

Teamwork

HyDraw helps standardization and teamwork. Multiple users within a local area network can share a common HyDraw library. This enhances productivity of the design and engineering team.

Customization

Customize HyDraw to your specific need using the library and data management console. Save custom components data with symbols tagged to a specific model code and relevant OEM catalog data.

More...

Dynamic Directional Control (DC) Valve design and OEM-specific circuit design with Parts List from component properties held in the library make the software very productive.

Net List creation, Manifold Cost estimation and interface to FluidPowerTools.com enable significant cost and time savings.

Work Smart! Use HyDraw[®] today.

2. Support

User Manual

The HyDraw[®] CAD⁸⁰⁰ User Manual provides comprehensive information on the features, commands, usage, processes, and design methodology of HyDraw.

The user manual can be used as a comprehensive reference to the command set and usage of HyDraw.

****Click the Circuit Diagrams command on the Help ribbon menu to view the user manual in the Adobe Acrobat .pdf format.**

Support

If you have a question about HyDraw CAD⁸⁰⁰ email us at support@VESTusa.com.

Please include the following:

- Version number of the software you use.
To see the version of HyDraw on your machine, Click **About HyDraw** from the Help ribbon menu.
- Configuration of your machine.
- Exact messages, if any, on the screen.
Send a screen capture, if possible.
- Description of the problem and what you were doing when the problem occurred.
- Description of how you tried to solve the problem.

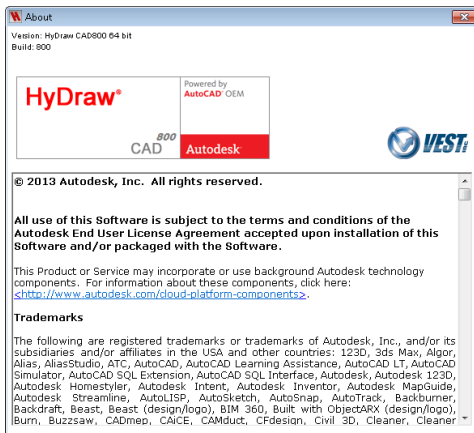
*****Click the About HyDraw command on the Help ribbon menu to view the About HyDraw message box indicating the software version number.**

The Contents and Index listing guides you to relevant material for study and reference.

The User Manual Adobe Acrobat file includes a left hand column nested menu for easy chapter navigation.
(Acrobat Reader : View > Navigation Panels > Bookmarks)



About HyDraw CAD



About HyDraw message box

Workspace

The screenshot displays the HyDraw CAD800 software interface. The main workspace shows a hydraulic schematic diagram with various components like pumps, valves, and cylinders. The interface includes a top ribbon menu, a left-hand Component Library, and a right-hand Property Manager. A list of features is overlaid on the right side of the workspace.

Feature List:

- HyDraw Startup
- HyDraw CAD Ribbon Menu
- HyDraw Library Explorer
- HyDraw Property Manager
- HyDraw Options

Component Library:

- Pump
- Directional Control Valve
- Check and Shuttle Valve
- Flow Control and Shut Off Valve
- Pressure Control Valve
- Stackable Valve
- Stackable Valve - Flipped
- Flange Valve
- Proportional Valve
- Servo Valve
- Slip-In Cartridge Valve
- Screw-In Cartridge Valve
- Filter and Strainer
- Hydraulic Motor and Rotary Actuator
- Cylinder
- Manifold and Subplate
- Manifold and Subplate - Flipped
- Gauge, Switch and Measuring Device
- Accumulator
- Heat Exchanger
- Electric Motor
- Hoses and Connectors
- Reservoir and Power Unit components
- Miscellaneous
- Mobile Valves

Property Manager:

System

Include in Parts List

ID: 9

Style: None

Settings

Requirements

Flow (gpm): 6

Pressure (psi): 3000

Code: 4WE6J63/EW230N9K4

Model Family: 4WE6

Part Number: 678524

Description: Direction Control Valve

Manufacturer: Bosch Rexroth

Cost: 27

Assembly Cost: 2

List Price: 236

Rated Flow (gpm): 21

Pressure Loss @ Rated Fl: 145

Rated Pressure (psi): 5000

Cavity/Footprint/Interface: D03

Malfunction Flow (gpm): 21

Voltage: 230

Frequency: 50

Bolt Shoulder Height (in): 1.4

Installation Torque (Steel): 5.9 lb-ft/8 Nm

Installation Torque (Aluminum): 5.9 lb-ft/8 Nm

Catalog Number: RE 23178/08.08

Accessories:

14 (R901017022)

Documents:

Data Sheet

Documents/Industrial Reser

CAD Files:

3. HyDraw Startup

Note:

For HyDraw CAD installation, refer Ch68

Open HyDraw CAD⁸⁰⁰

- Double click the HyDraw CAD⁸⁰⁰ desktop shortcut icon.

Alternatively,
Click **Start**

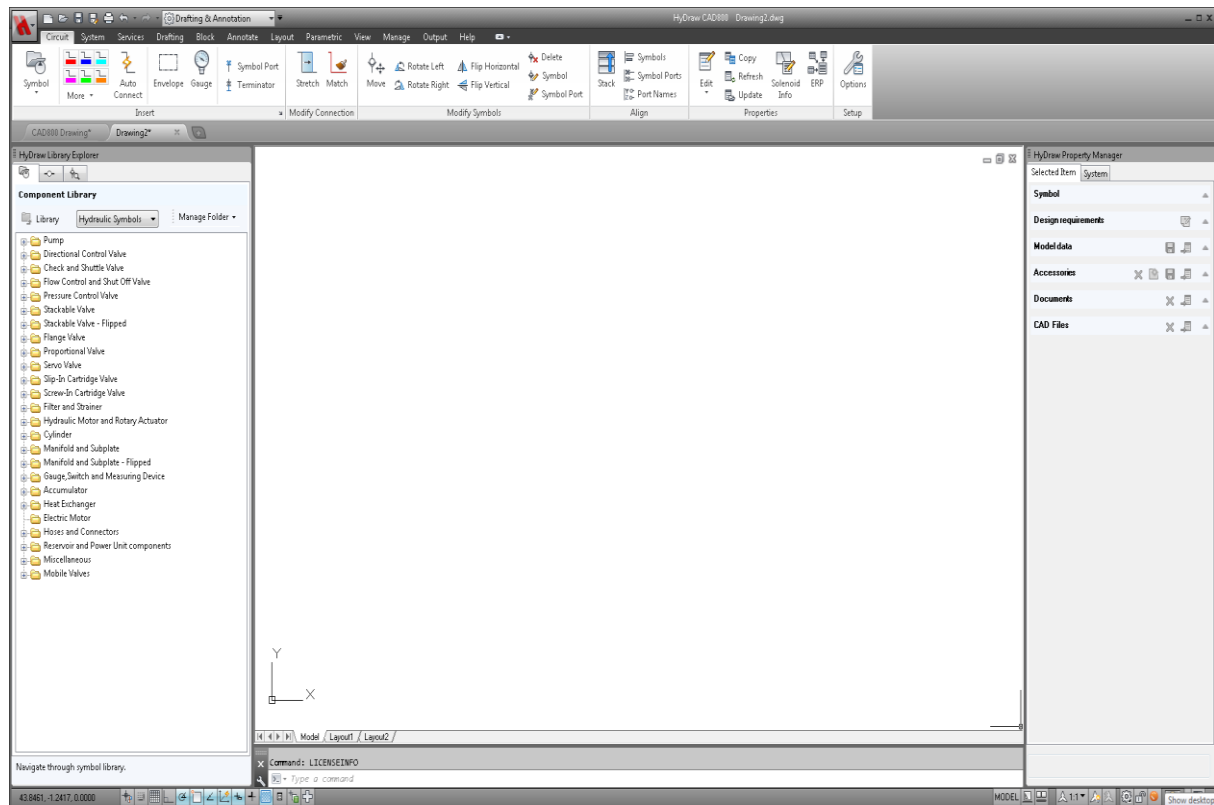
> All Programs

> VEST

>HyDraw CAD⁸⁰⁰

>HyDraw CAD⁸⁰⁰

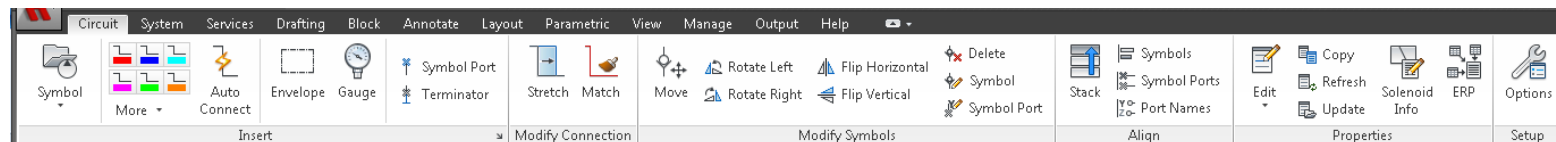
HyDraw CAD opens with the ribbon menu, Library Explorer and Property Manager.



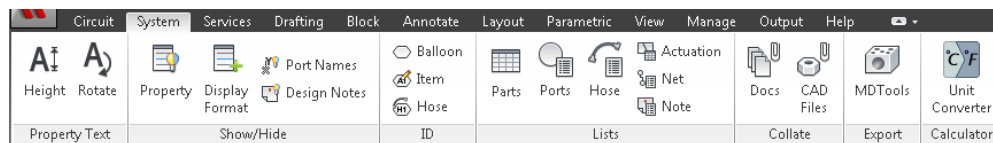
HyDraw CAD opens with Library Explorer and Property Manager

4. HyDraw CAD Ribbon Menu

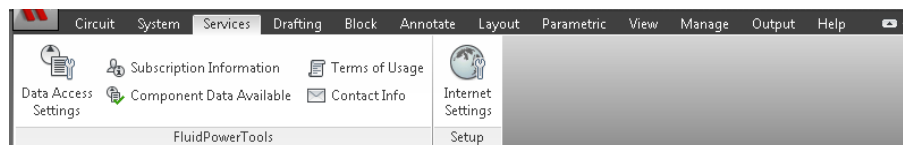
HyDraw® CAD has a ribbon menu with four tabs, *Circuit*, *System*, *Services*, and *Help* for ready access to the frequently used commands.



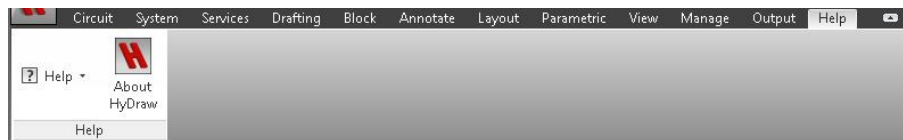
HyDraw CAD – Circuit Ribbon menu



HyDraw CAD – System Ribbon menu



HyDraw CAD – Services Ribbon Menu



HyDraw CAD – Help Ribbon Menu

5. HyDraw Library Explorer

The HyDraw® Library Explorer provides access to symbols, external ports, and components.

Locate them using either the tree view structure or the search option.

The screenshot displays the HyDraw CAD800 software interface. On the left, the **HyDraw Library Explorer** panel is open, showing a tree view of components under the **Hydraulic Symbols** category. The tree structure includes:

- Pump
- Directional Control Valve
- Check and Shuttle Valve
- Flow Control and Shut Off Valve
- Pressure Control Valve
- Stackable Valve
- Stackable Valve - Flipped
- Flange Valve
- Proportional Valve
- Servo Valve
- Slip-In Cartridge Valve
- Screw-In Cartridge Valve
- Filter and Strainer
- Hydraulic Motor and Rotary Actuator
- Cylinder
- Manifold and Subplate
- Manifold and Subplate - Flipped
- Gauge, Switch and Measuring Device
- Accumulator
- Heat Exchanger
- Electric Motor
- Hoses and Connectors
- Reservoir and Power Unit components
- Miscellaneous
- Mobile Valves

The main workspace shows a hydraulic schematic diagram with various components like pumps, valves, cylinders, and hoses. The **Component Library** panel on the left is highlighted with a red box. Below the schematic, there are two tables:

ITEM ID	QTY	MODEL CODE	DESCRIPTION	MANUFACTURER
1	1	M3715	Electric Motor	Baldor
2	3	DYN-CFHP350ASAE	Pressure Gauge, 0-5000 PSI	DYNAM
3	1	022M/SAEB	Motor/Pump Adapter	BSF
4	1	Z21-20	Hose	Parker
5	1	PE606R00B6Z0PA00N00STATU	Pump Variable Single	Parker
6	1	P30-100	Suction Strainer	Flow-ezy
7	2	A046ZPZ-N	Direct Acting Pressure Relief Valve	Parker
8	1	CXDXAN	Check Valve	Sun Hydraulics
9	1	4WE6J3X/EW230N9K4	Direction Control Valve	Bosch Rexroth
10	1	50AS10502BP05G20	Filter	Parker
11	1	SD10-01-CNH	Needle Valve	Hydac
12	1	LS167	Float & Temperature Switch	Gems
13	1	BR210	Filter/Breather	Eaton
14	1	R901017022	Black Mating Connector	Bosch Rexroth

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
BR, C, LVL, R	SAE O-ring	#6 SAE	#6 SAE
MC, MP, MR	SAE O-ring	#4 SAE	#4 SAE
P1, P2, PR1	SAE O-ring	#8 SAE	#8 SAE
T, TRI	SAE O-ring	#10 SAE	#10 SAE

NET NAME	NET LIST	FUNCTION	9-S1	9-S2
NET-1	MC, C, 11-2	Cylinder Ext.	○	○
NET-2	T, PA-2, 9-T	Cylinder Ref.	○	○
NET-3	MP, P2, P1, PA-1, S-P			
NET-4	MR, R, 7B-1, 8-2			
NET-6	11-1, 9-B			
NET-7	7B-2, 6-1, 9-A			


At the bottom right, there is a **VEST** section with a **Cylinder Control** diagram. The status bar at the bottom shows the command **Model / Layout1** and the coordinates **15.4221, 10.4300, 0.0000**.

Symbols and external ports inserted from HyDraw Library Explorer to design schematic

1. Open HyDraw Library Explorer

- Click Circuit > **From Library Explorer** from the Symbol option on the HyDraw® CAD⁸⁰⁰ ribbon menu.

Alternatively,

- Click Circuit > Symbol  on the HyDraw ribbon menu.


The HyDraw Library Explorer dockable window displays and docks on the left of the screen.

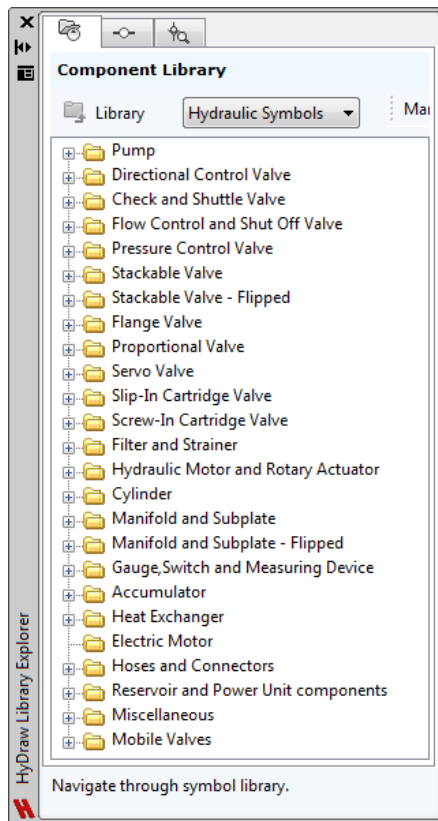
2. Move HyDraw Library Explorer

- Select **HyDraw Library Explorer** using the caption bar and drag or dock it to the desired location.

HyDraw stores the information about the docking location of the Library Explorer.


3. Show/Hide HyDraw Library Explorer

- Use the automatic **Show/Hide** feature of the Library Explorer to maximize the drawing space.
- Right click on the window border and uncheck **Allow Docking**.
- Use  icon to Show/Hide the Library Explorer.

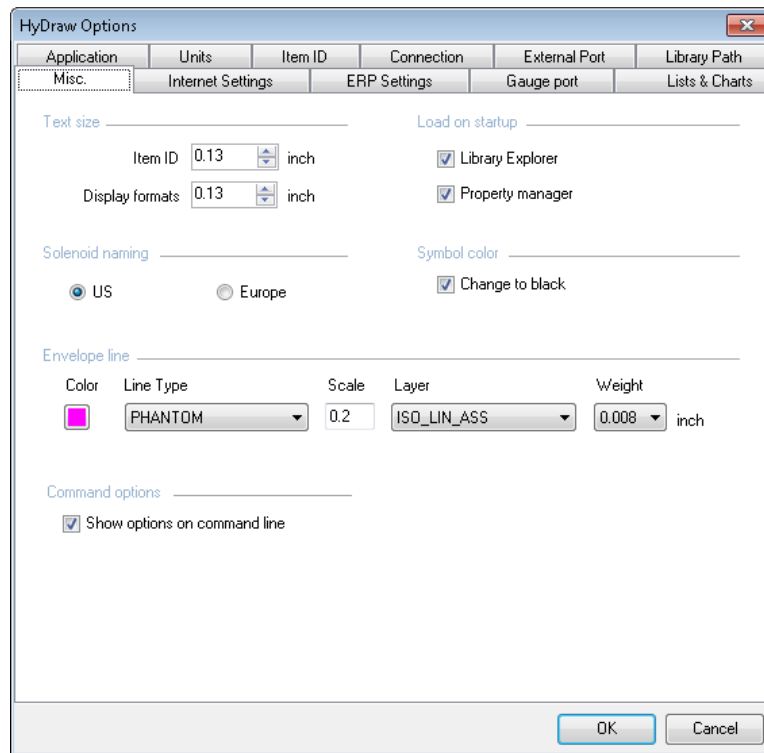


Show/Hide HyDraw Library Explorer

4. Load HyDraw Library Explorer on Startup

- Select Circuit >  from the HyDraw® CAD⁸⁰⁰ ribbon menu.
- Click the **Misc.** tab.
- Select **Library Explorer** from the Load on startup group box.

When subsequently opened, the Library Explorer docks to its previous location.



The HyDraw Options dialog box is shown with the 'Misc.' tab selected. The dialog has a title bar 'HyDraw Options' and a close button. Below the title bar is a tabbed interface with tabs: 'Application', 'Units', 'Item ID', 'Connection', 'External Port', and 'Library Path'. The 'Misc.' tab is active, showing settings for 'Internet Settings', 'ERP Settings', 'Gauge port', and 'Lists & Charts'. The 'Load on startup' section has two checked options: 'Library Explorer' and 'Property manager'. The 'Text size' section has 'Item ID' and 'Display formats' both set to '0.13 inch'. The 'Solenoid naming' section has 'US' selected. The 'Envelope line' section has 'Color' set to magenta, 'Line Type' set to 'PHANTOM', 'Scale' set to '0.2', 'Layer' set to 'ISO_LIN_ASS', and 'Weight' set to '0.008 inch'. The 'Command options' section has 'Show options on command line' checked. 'OK' and 'Cancel' buttons are at the bottom right.

Application	Units	Item ID	Connection	External Port	Library Path
Misc.	Internet Settings	ERP Settings	Gauge port	Lists & Charts	

Text size _____ Load on startup _____

Item ID 0.13 inch ☒ Library Explorer


Display formats 0.13 inch ☒ Property manager

Solenoid naming _____ Symbol color _____

☒ US ☐ Europe ☒ Change to black

Envelope line _____

Color Line Type Scale Layer Weight

 PHANTOM 0.2 ISO_LIN_ASS 0.008 inch

Command options _____

☒ Show options on command line

OK Cancel

HyDraw Options

6. HyDraw Property Manager

The HyDraw® Property Manager displays assigned properties of the selected items, such as symbols, ports, connection lines, envelope, and systems.

Search the component or model code with given inputs in the Fetch Model Data.

Configure your own design requirements and save the data into the library.

The screenshot displays the HyDraw CAD800 software interface. The main workspace shows a hydraulic schematic with various components like pumps, valves, and cylinders. To the right, there is a parts list table. Below the schematic, there are two smaller tables: 'NET NAME' and 'FUNCTION'. The 'HyDraw Property Manager' panel is open on the right side, showing properties for the selected item 'Cylinder Control'.

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
BR, C, LVL, R	SAE O-ring	#6 SAE	#6 SAE
MC, MP, MR	SAE O-ring	#8 SAE	#8 SAE
P1, P2, PRI	SAE O-ring	#10 SAE	#10 SAE
T, TR1	SAE O-ring	#10 SAE	#10 SAE

NET NAME	NET LIST	FUNCTION	9-S1	9-S2
NET-1	MC, C, 11-2	Cylinder Ext.	○	⊗
NET-2	T, 7A-2, 9-T	Cylinder Ret.	⊗	○
NET-3	MP, P2, P1, 7A-1, 9-P			
NET-4	MR, R, 7B-1, 8-2			
NET-6	11-1, 9-B			
NET-7	7B-2, 8-1, 9-A			

HyDraw Property Manager

Selected Item: **System**

Symbol ☒ Include in Parts List

Item ID: 9
 Assembly ID: None
 Balloon Style: None
 Display Setting: [icon]

Design requirements [icon]

Flow (gpm): 6
 Pressure (psi): 3000

Model data [icon]

Model Code: 4wE6S/Ew230N9K4
 Model Family: 4wE6
 Part Number: 679324
 Description: Direction Control Valve
 Manufacturer: Bosch Rexroth
 Cost: 27
 Assembly Cost: 2
 List Price: 236
 Rated Flow (gpm): 21
 Pressure Loss @ Rated: 145
 Rated Pressure (psi): 5000
 Cavity/Footprint/Interfac: D03
 Malfunction Flow (gpm): 21
 Voltage: 230
 Frequency: 50
 Bolt Shoulder Height (in): 1.4
 Installation Torque (Steel): 5.9 lb ft/8 Nm
 Installation Torque (Alun): 5.9 lb ft/8 Nm
 Catalog Number: RE 23178/08 08

Accessories [icon]


> 14 (R901017022) [icon]

Documents [icon]

Set Item ID of the selected item

Display assigned properties of the selected symbol using the HyDraw Property Manager

1. Open HyDraw Property Manager

Click Circuit >  on the HyDraw® CAD⁸⁰⁰ ribbon menu.

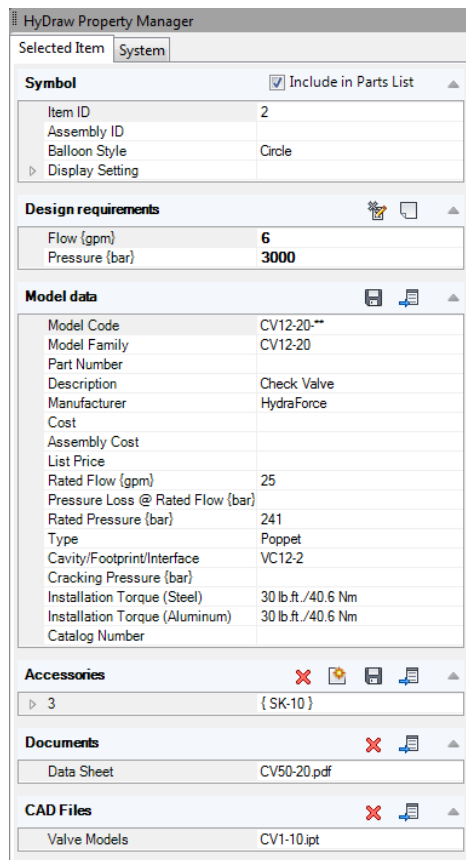
The HyDraw Property Manager dockable window displays and docks on the right side of the screen.

The HyDraw Property Manager displays two tabs, **Selected Item** and **System**.

Dock HyDraw Property Manager

To move the Property Manager window, select it using the caption bar, then drag and dock it to the desired location.

HyDraw stores the information about the docking location of the Property Manager



The HyDraw Property Manager window is shown with the **System** tab selected. It contains several sections for configuring a valve:

- Symbol**: Includes Item ID (2), Assembly ID, Balloon Style (Circle), and a Display Setting dropdown. An "Include in Parts List" checkbox is checked.
- Design requirements**: Includes Flow (gpm) (6) and Pressure (bar) (3000).
- Model data**: Includes Model Code (CV12-20), Model Family (CV12-20), Part Number, Description (Check Valve), Manufacturer (HydraForce), Cost, Assembly Cost, List Price, Rated Flow (gpm) (25), Pressure Loss @ Rated Flow (bar), Rated Pressure (bar) (241), Type (Poppet), Cavity/Footprint/Interface (VC12-2), Cracking Pressure (bar), Installation Torque (Steel) (30 lb.ft./40.6 Nm), Installation Torque (Aluminum) (30 lb.ft./40.6 Nm), and Catalog Number.
- Accessories**: Includes a list with 3 items, { SK-10 }.
- Documents**: Includes a list with 1 item, CV50-20.pdf.
- CAD Files**: Includes a list with 1 item, CV1-10.ipt.

HyDraw Property Manager

Selected Item tab

The Selected Item tab page displays the properties of the selected component.


The Selected Item tab page remains collapsed, if the item is not selected in the drawing.

HyDraw Property Manager


Selected Item System

Symbol ☒ Include in Parts List ▲


Item ID	2
Assembly ID	
Balloon Style	Circle
Display Setting	

Design requirements  ▲


Flow (gpm)	6
Pressure (bar)	3000

Model data  ▲


Model Code	CV12-20-*
Model Family	CV12-20
Part Number	
Description	Check Valve
Manufacturer	HydraForce
Cost	
Assembly Cost	
List Price	
Rated Flow (gpm)	25
Pressure Loss @ Rated Flow (bar)	
Rated Pressure (bar)	241
Type	Poppet
Cavity/Footprint/Interface	VC12-2
Cracking Pressure (bar)	
Installation Torque (Steel)	30 lb.ft./40.6 Nm
Installation Torque (Aluminum)	30 lb.ft./40.6 Nm
Catalog Number	

Accessories  ▲

3	{ SK-10 }
---	-----------

Documents  ▲

Data Sheet	CV50-20.pdf
------------	-------------

CAD Files  ▲

Valve Models	CV1-10.ipt
--------------	------------


Selected Item tab page

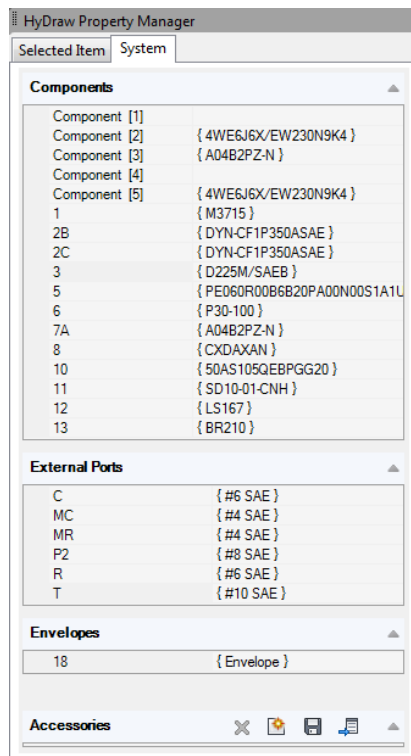
System tab

The System tab page displays properties of the complete circuit.

It automatically expands all sections, whenever the schematic is opened in the drawing.


When the item is selected or the schematic is open, the respective menu bar expands and the assigned values display.

Click  to expand/collapse.

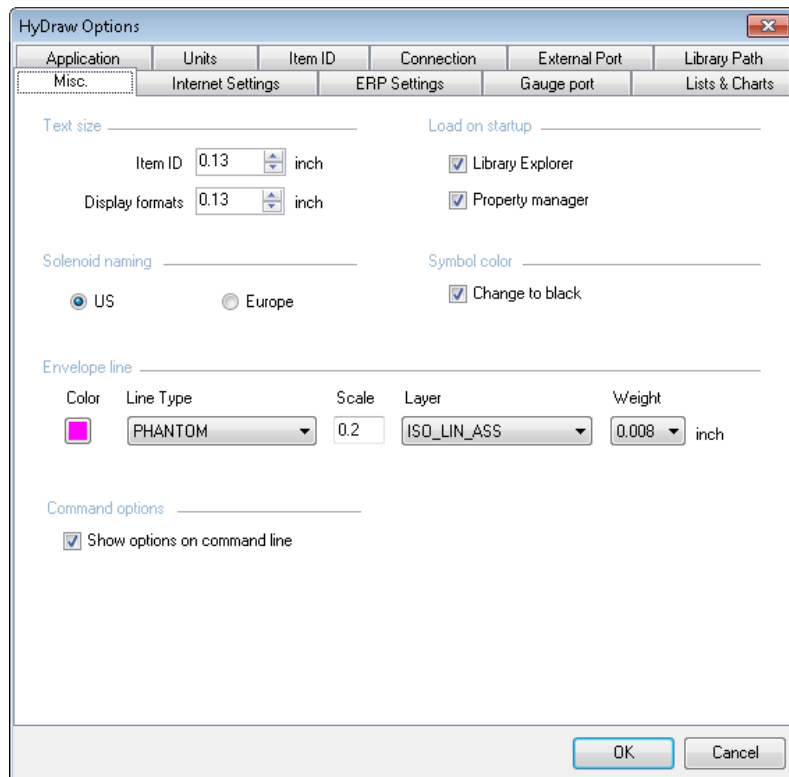


System tab page

2. Load HyDraw Property Manager on Startup

1. Select Circuit >  in the HyDraw® CAD⁸⁰⁰ ribbon menu.
2. Click the **Misc.** tab.
3. Select the **Property manager** checkbox from the Load on startup section.

Subsequently, the Property Manager opens and docks at its previous location.



HyDraw Options: Misc.

7. HyDraw Options

Customize HyDraw® settings, such as

Application, Units, ItemID, Connection, External Port, Lists & Charts, Library Path, Misc., Internet Settings, ERP Settings and Gauge port.

1. Application

The Application option enables you to select one of the three applications Hydraulic, Pneumatic, and Electrical.

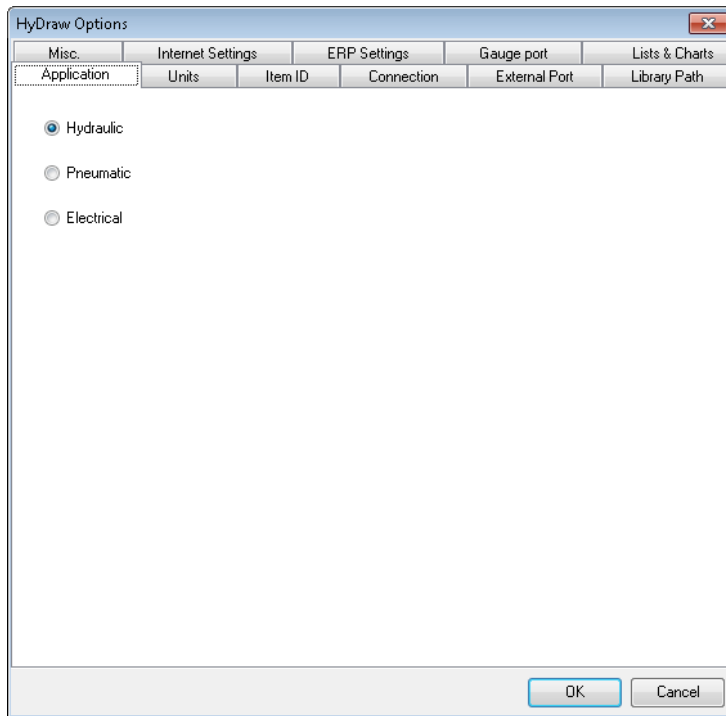
1. Click the **Application** tab.

The Application tab page displays.

2. Select the required application: Hydraulic, Pneumatic, or Electrical.

The application is selected in the Search From Library tab page in the HyDraw Library Explorer dockable window.

3. Click **OK**.



Application tab page

2. Units

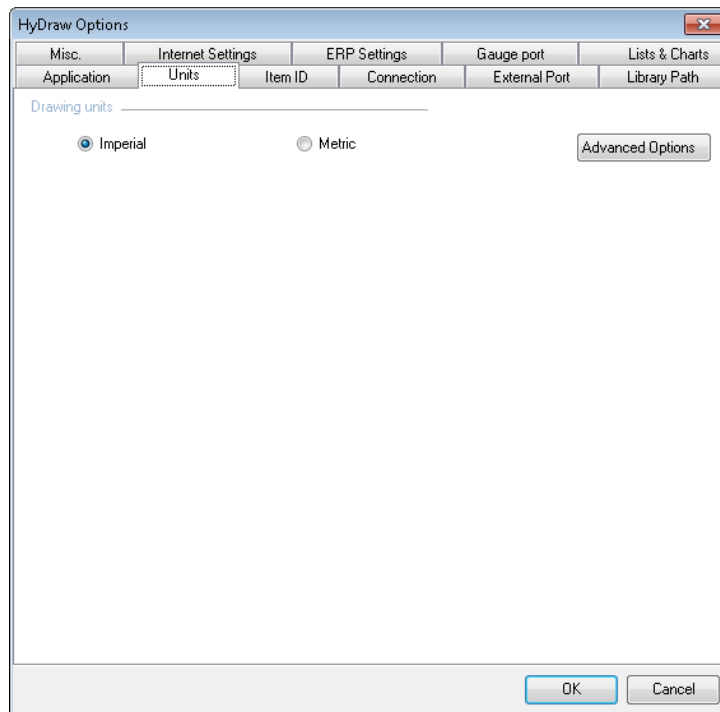
The Units option enables you to select the unit for the selected application.

1. Click the **Units** tab.
The Units tab page displays.
2. Select the required drawing units (Imperial or Metric).

CAUTION!

Units should not be changed after symbol insertion.

3. Click **Advanced Options**.
Modify Units grid displays.



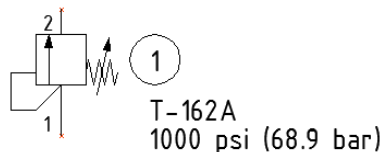
Units tab page

Units tab – Advanced Options

1. Configure each unit category by selecting the **Primary Unit**.
2. Select the **Display alternate unit** check box to display alternate unit along with the primary unit, if required.

The Alternate Unit column displays.

3. Configure the alternate units.
4. Click **Reset** button to restore the default units.
5. Click **OK** to apply and exit.



Displays Dual units in the drawing

HyDraw Options

Misc. Internet Settings ERP Settings Gauge port Lists & Charts

Application Units Item ID Connection External Port Library Path

Drawing units

☐ Imperial ☒ Metric Advanced Options

Modify Units

Unit Category	Primary Unit	Alternate Unit
Acceleration	mm/sec/sec	in/sec/sec
Angle	rad	
Area	mm^2	in^2
Current	amp	mA
Density	lb/ft^3	lb/in^3
Energy	J	cal
Flow	LPM	gpm
Force	gf	dyn
Frequency	Hz	RPM
Length	mm	in
Mass & Weight	g	lb
Power	KW	HP

☒ Display alternate unit Reset

OK Cancel

Units tab – Display alternate unit

3. External Port

Customize the external port in a circuit.

1. Click the **External Port** tab.

The External Port tab page displays.

2. Click an appropriate button to configure the external port either circle, oval, line, rectangle, square shape or Custom shape.

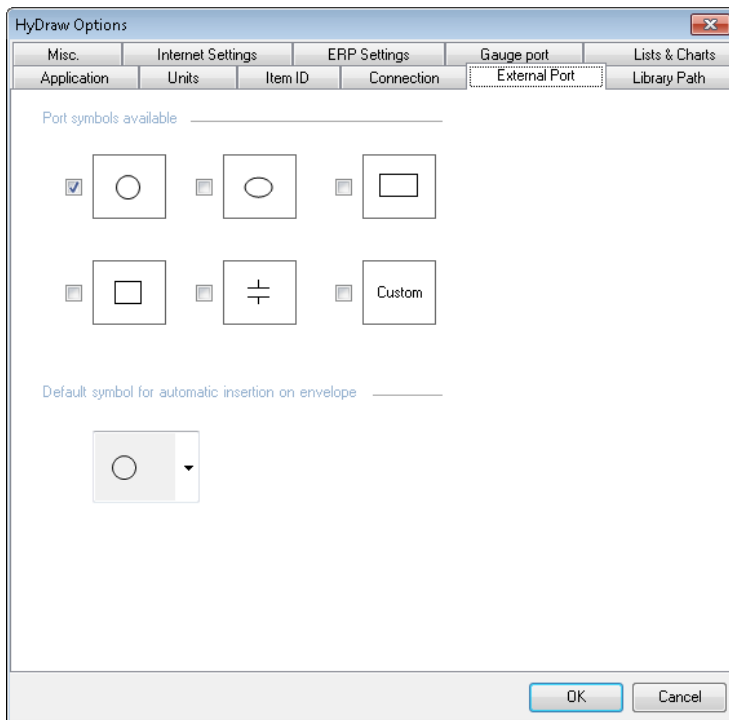
The respective shapes display in the port preview section of the HyDraw® Library Explorer window and can be inserted on the envelope line of the circuit.

When you select the custom shape then all the custom shapes present in the library will display in the port preview section of the HyDraw Library Explorer window.

3. Select the shape in the **Default symbol for automatic insertion on envelope** drop down to insert automatically when an envelope intersects with the connection line.
4. Click **OK** to apply and exit.

Note:

For adding custom shape to the HyDraw library refer Ch72.










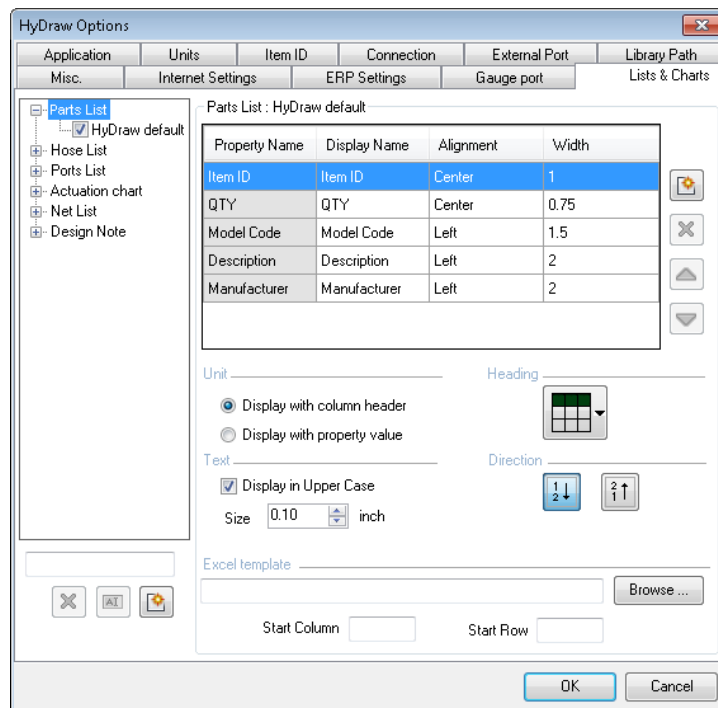
External Port tab page

4. Lists & Charts

Parts List

Customize the Parts List format

1. Click the **Lists & Charts** tab of HyDraw[®] options to select **Parts list**.
2. To rename a selected format, type the new name in the text box and then click .
3. To add a new format, type the new name in the text box and then click  below the textbox.
4. To delete a selected format, click  below the textbox.
5. To move up, select the item and click .
6. To move down, select the item and click .
7. To delete a property, click .
You cannot delete property item ID.
8. To add Part list columns, click .
The Select Parts List Columns dialog box displays.
9. To include Quantity column, select the Quantity check box in the miscellaneous section.
10. Select the required properties and click **OK**.



Parts List tab page

The selected properties are displayed in the Parts List tab page- Configure columns.

Unit: The Display with column header option shows the unit in the column header of the parts list column.

The Display with property value option shows the unit with the property value of each row.

Text: The Display in Upper Case option shows the list in the upper case. Also, you can change the text size of the list.

Heading: The Heading dropdown option selects the list header direction. For example, top, bottom or none.

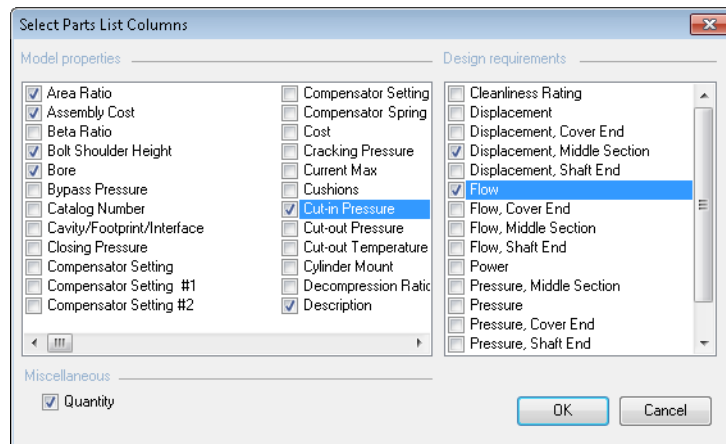
Direction: Sort the list in an ascending or descending order.

11. Select the **Browse** button to export the Parts list in the Excel template format. Select the starting rows and columns of the given template.
12. Click **OK**.

The selected properties are displayed in a tabular form when the Parts list is created in the drawing.

Note:

To learn more about Parts List, refer Chapter 53.








Select Parts List Columns


Hose List

Customize the Hose List format.

1. Click the **Lists & Charts** tab of HyDraw® Options and select **Hose List**.

The Hose List tab page displays.

2. To rename a selected format, type the new name in the text box and then click .
3. To add a new format, type the new name in the text box and then click  below the textbox.
4. To delete a selected format, click  below the textbox.
5. To move up, select the item and click .
6. To move down, select the item and click .

7. To delete a property, click .

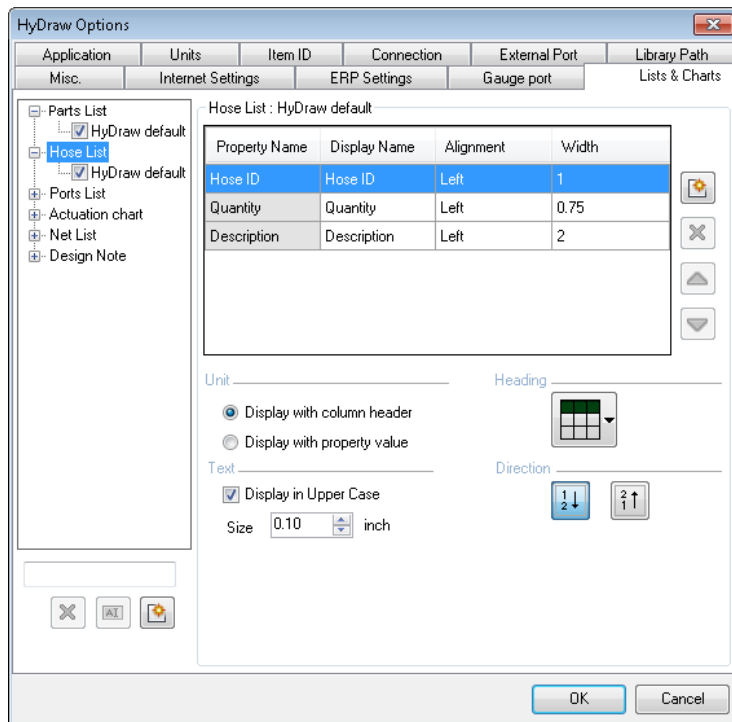
You cannot delete the property name of the Item ID.

8. Click  to add Hose list columns.

The Select Hose List columns checklist box displays.

9. Select the required properties and click **OK**.

The selected properties are displayed in the Hose List tab page- Configure columns.



Hose List tab page

Unit: *The Display with column header option shows the unit in the column header of the parts list column. The Display with property value option shows the unit with the property value of each row.*

Text: *The Display in Upper Case option shows the list in the upper case. Also, you can change the text size of the list.*

Heading: *The Heading dropdown selects the list header direction. For example, top, bottom or none.*

Direction: *Sort the list in an ascending or descending order.*

10. Click **OK**.

The selected properties are displayed in a tabular form when the Hose list is created in the drawing.

Note:


To learn more about Hose List, refer Chapter 55.


Ports List


Customize the Ports List format.


1. Click the **Lists & Charts** tab of HyDraw Options to select **Ports List**.

The Ports List tab page displays.


2. To rename a selected format, type the new name in the text box and then click .

3. To add a new format, type the new name in the text box and then click  below the textbox.


4. To delete a selected format, click  below the textbox.

5. To move up, select the item and click .

6. To move down, select the item and click .

7. To delete a property, click .

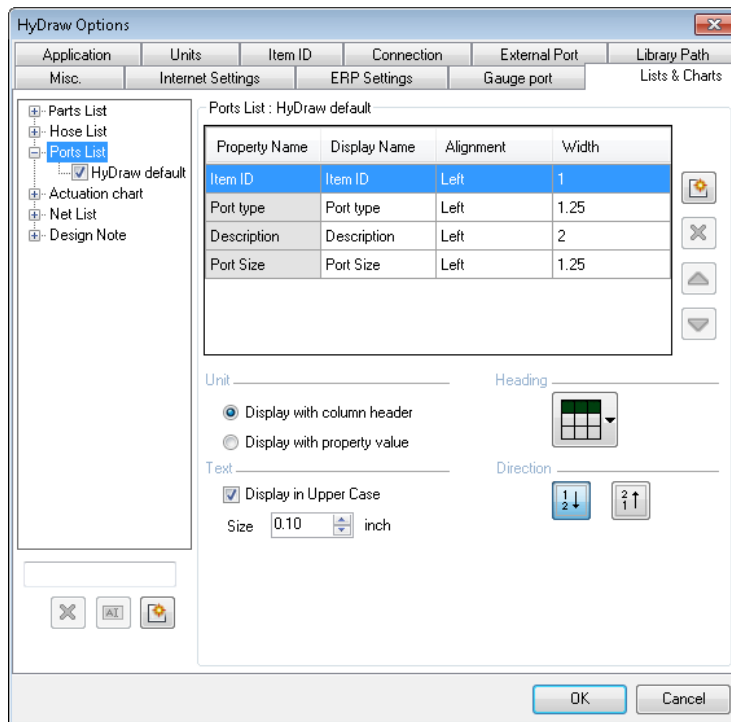
You cannot delete Property Name of Item ID.

8. Click  to add port list columns.

The Select Ports List columns checklist box displays.

9. Select the required properties and click **OK**.

The selected properties are displayed in the Ports List tab page- Configure columns.



Ports List tab page

Unit: *The Display with column header option shows the unit in the column header of the parts list column.*

The Display with property value option shows the unit with the property value of each row.

Text: *The Display in Upper Case option shows the list in the upper case. Also, you can change the text size of the list.*

Heading: *The Heading dropdown selects the list header direction. For example, top, bottom or none.*

Direction: *Sort the list in an ascending or descending order.*

10. Click **OK**.

The selected properties are displayed in a tabular form when the Ports list is created in the drawing.

Note:

To learn more about Ports List, refer Chapter 54.

Actuation Chart

Customize the Actuation Chart format.

1. Click the **Lists & Charts** tab of HyDraw Options and select **Actuation chart**.

The Actuation chart tab page displays.


2. To rename a selected format, type the new name in the text box and then click




3. To add a new format, type the new name in the text box and then click



below the textbox.

4. To delete a selected format, click  below the textbox.

5. To move up, select the item and click .

6. To move down, select the item and click .

7. Select the required properties and click **OK**.

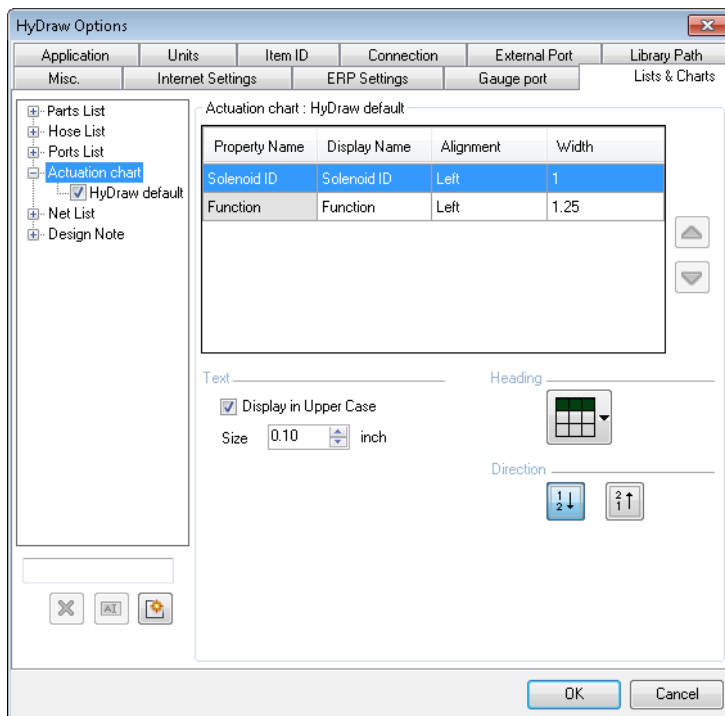
Text: The Display in Upper Case option shows the list in the upper case. Also, you can change the text size of the list.

Heading: The Heading dropdown selects the list header direction. For example, top, bottom or none.

Direction: Sort the list in an ascending or descending order.

8. Click **OK**.

The selected properties are displayed in a tabular form when the Actuation list is created in the drawing.



Actuation Chart tab page

Net List

Customize the Net List format.

1. Click the **Lists & Charts** tab of HyDraw Options to select **Net List**.

The Net List tab page displays.


2. To rename a selected format, type the new name in the text box and then click




3. To add a new format, type the new name in the text box and then click



below the textbox.

4. To delete a selected format, click  below the textbox.

5. To move up select the item and click .

6. To move down select the item and click .

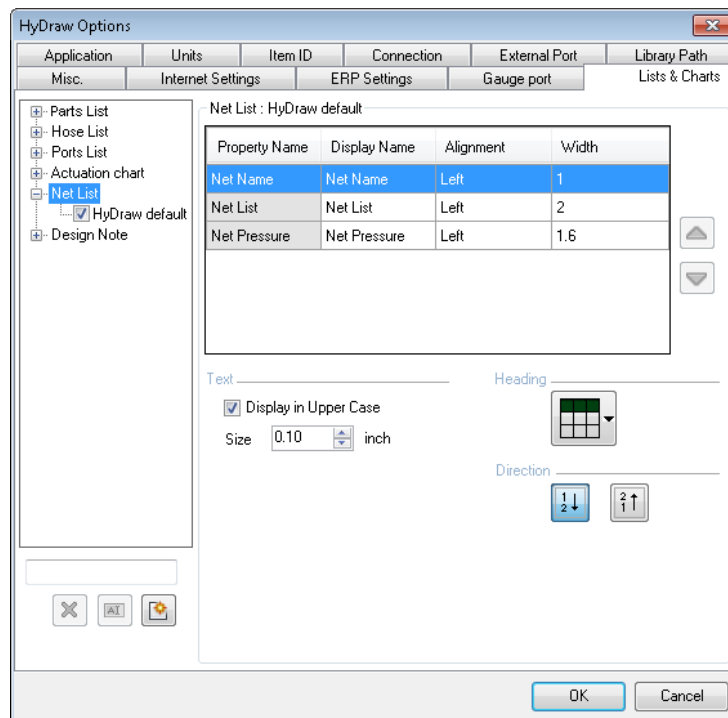
7. Select the required properties and click **OK**.

Text: The *Display in Upper Case* option shows the list in the upper case. Also, you can change the text size of the list.

Heading: The *Heading* dropdown selects the list header direction. For example, top, bottom or none.

Direction: Sort the list in an ascending or descending order.

The selected properties are displayed in a tabular form when the Net list is created in the drawing.





Net List page




Design Note

Customize the Design Note List format

1. Click the **Lists & Charts** tab of HyDraw Options to select **Design Note**.

The Design Note page displays.

2. To rename a selected format, type the new name in the text box and then click .
3. To add a new format, type the new name in the text box and then click  below the textbox.

4. To delete a selected format, click .
5. To move up select the item and click .
6. To move down select the item and click .
7. Select the required properties and click **OK**.

Text

The Display in the Upper Case option shows the list in the upper case. Also, you can change the text size of the list.

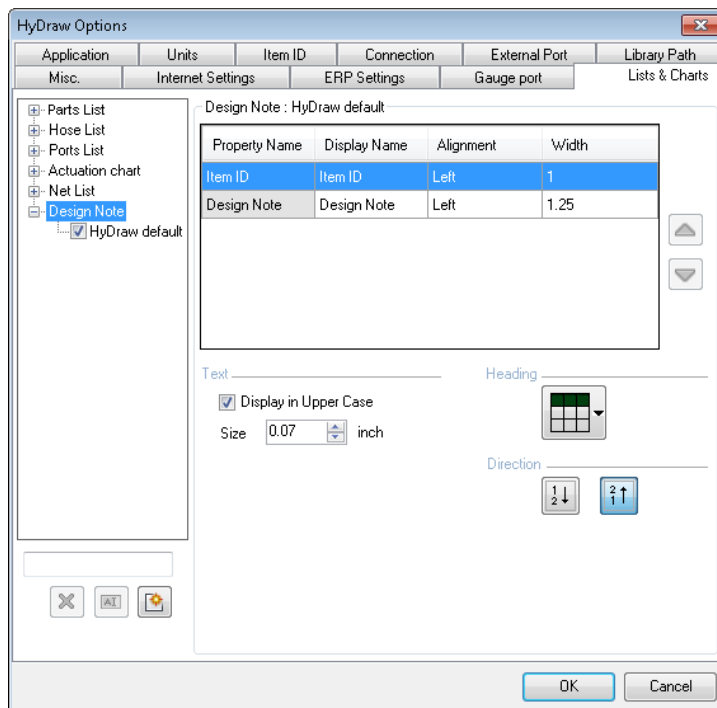
Heading

*The Heading dropdown selects the list header direction.
For example, top, bottom or none.*

Direction

Sort the list in an ascending or descending order.

The selected properties are displayed in a tabular form when the Design Note list is created in the drawing.



Design List page

5. Library Path

Multiple users have easy access to the library and components data from a common source over a network.

1. Click the **Library Path** tab of HyDraw® Options.

The Library Path tab page displays.

2. Select the **Local Library** option.
3. Select the **Enable modification** check box to allow you to modify library.
4. Click **Browse...**
5. Navigate to the folder where the HyDraw® library data is stored.
6. Repeat above steps for each of the specified HyDraw library paths.
7. Click **OK**.

All the HyDraw library paths are configured.

8. Select the **Corporate Library** option to configure second library path of your common Network library and repeat steps 3 to 7, if required.

Data Library

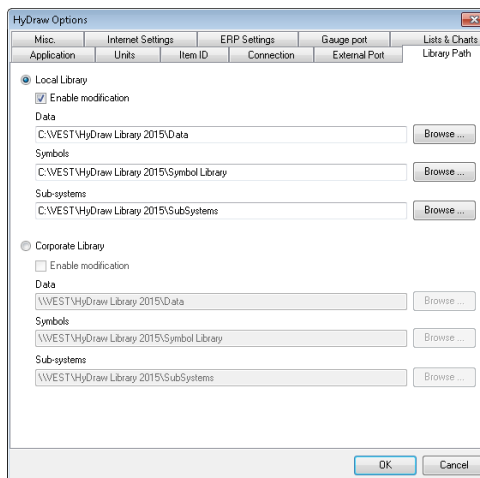
This section specifies the folder path that contains component data, library listing data, and manifold manufacturing estimation data.

Symbol Library

This section specifies the folder path that contains all libraries.

Sub-systems

This section specifies the folder path that contains user-created circuit drawings and its menu data.



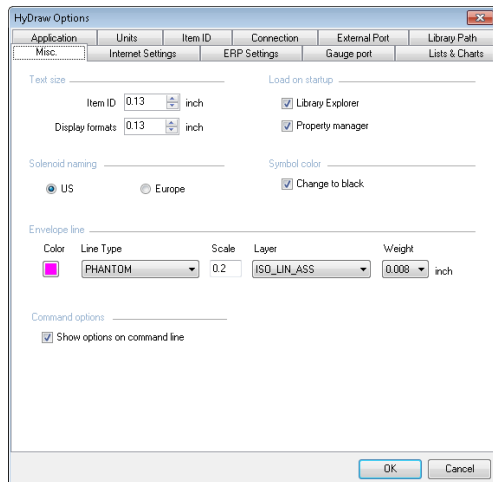
Library Path tab page

6. Misc.

Configure text size, envelope line, symbol color, and solenoid naming convention for the US and Europe pattern.

It also enables you to load the HyDraw® Library Explorer and the HyDraw Property Manager at startup.

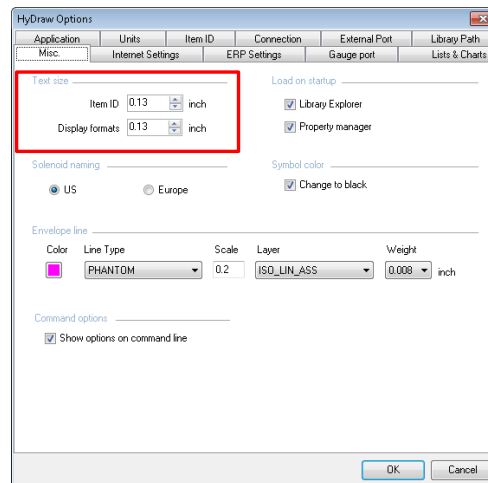
Click **Misc.** to display the tab page.



Misc. tab page

Text Size

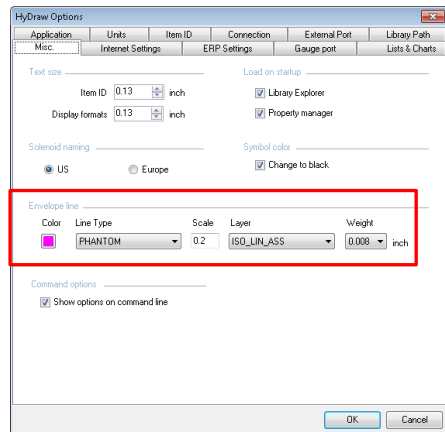
1. In the Text size group box, select the appropriate text size from the respective list box for item ID and display properties.
2. Click **OK** to effect the changes to the properties in the drawing.



Text size section

Envelope Line

1. In the Envelope line section, select the appropriate line pattern from continuous, phantom, and hidden list box options.
2. Click the **Color** button to open the color box and select the required color.
3. Enter the appropriate scale in the **Scale** textbox.
4. Click the combo box to select a layer from 0, Def points, ISO_LIN_ASS, ISO_LIN_FLU, ISO_LIN_HAT, ISO_LIN_UNI, ISO_TEX_DES, ISO_TEX_DES_EU, ISO_TEX_DES_US, ISO_TEX_IDE, ISO_TEX_POS, PORT_SYM.
5. In the **Weight** textbox, enter the appropriate weight of line.
6. Click **OK** to effect the changes in the library.

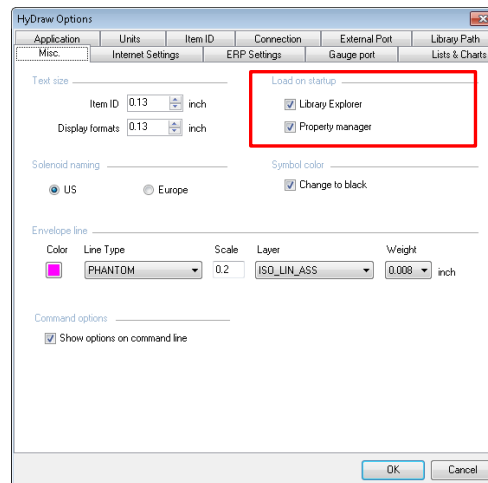


Envelope Line section

Load on startup

The Library Explorer and Property Manager can be loaded to HyDraw® on startup.

1. In the Load on startup group box, select the application you want to use for loading on startup.
The selected application loads and docks to the HyDraw drawing.
2. Click **OK** to effect the changes.

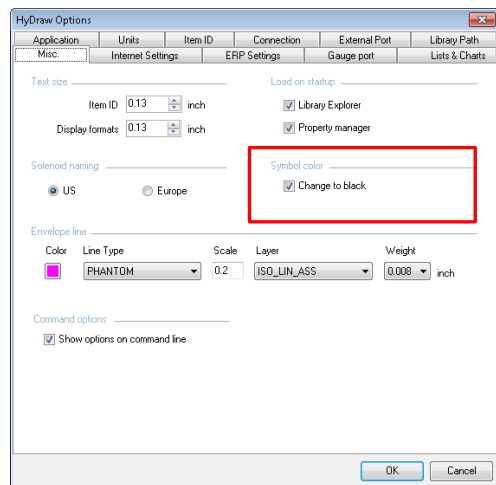


Load on startup section

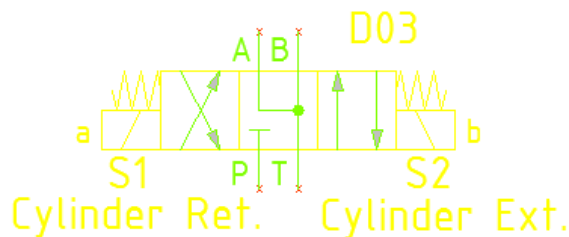
Symbol Color

All symbols in the HyDraw® library are created with the ISO standard colors. You can also change the color of these symbols to black.

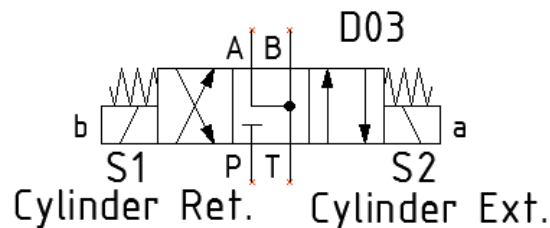
1. Select **Change to black** in the Symbol color section.
2. Click **OK** to affect the changes in the drawing.



Symbol color section



Colored Symbol



Black Symbol

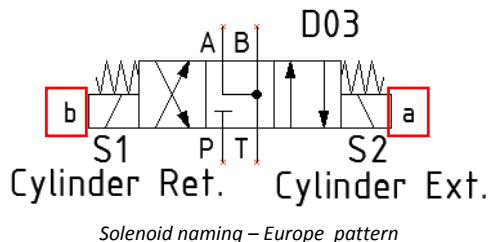
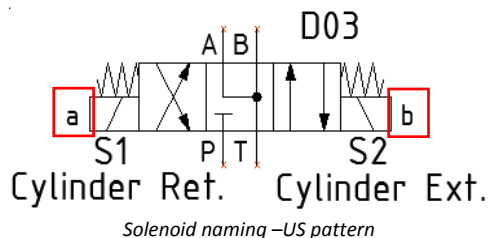
Solenoid Naming

Solenoid naming conventions for Directional Control Valve symbols are different for both US and Europe patterns.

You can only view one naming convention for a pattern at a time.

1. Select the appropriate pattern in the Solenoid naming section.
The selected pattern will affect the change of solenoid naming of symbols in the HyDraw® drawing.
2. Click **OK** to affect the changes.

Solenoid naming section



HyDraw Options

Application	Units	Item ID	Connection	External Port	Library Path
Misc.	Internet Settings	ERP Settings	Gauge port	Lists & Charts	

Text size _____ Load on startup _____

Item ID 0.13 inch ☒ Library Explorer

Display formats 0.13 inch ☒ Property manager

Solenoid naming _____ Symbol color _____

☒ US ☐ Europe ☒ Change to black

Envelope line _____

Color Line Type Scale Layer Weight

☐ PHANTOM 0.2 ISO_LIN_ASS 0.008 inch

Command options _____

☒ Show options on command line

OK Cancel

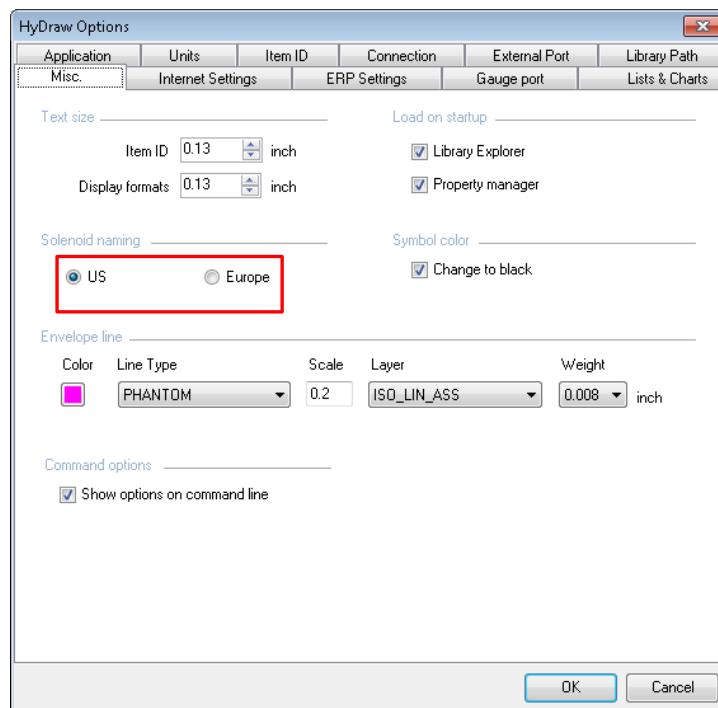
Solenoid naming

Command options

3. Select the **Show options on command line** check box, if you need to show the selection options on the command line.
4. Click **OK** to effect the changes.

Note:

If the *Show options on command line* option is unchecked, only a few HyDraw® commands will display a dialog box.



Command options

7. Internet Settings

Configure the Internet connection for FluidPowerTools*.

1. Click **Internet Settings** in the Services tab of the HyDraw® CAD ribbon menu.
The Internet Settings of the HyDraw Options dialog box displays.
2. Configure the required settings.

Note:

Refer Chapter 70, Para 2 for detailed configuration settings.

The screenshot shows the 'HyDraw Options' dialog box with the 'Internet Settings' tab selected. The dialog has a title bar with a close button. Below the title bar is a tabbed interface with six tabs: 'Application', 'Units', 'Item ID', 'Connection', 'External Port', and 'Library Path'. The 'Internet Settings' tab is active, showing a 'Configuration' section with two radio buttons: 'Automatically detect settings' (selected) and 'Use proxy server'. Below these are input fields for 'Address' and 'Port'. There is also a checkbox for 'Enable authentication', which is currently unchecked. Below this checkbox are input fields for 'User Name' and 'Password'. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

HyDraw Options – Internet Settings Tab

8. ERP Settings

Configure the ERP settings for ERP Interface.

1. Select **ERP Settings** from HyDraw® Options.
2. Browse the path of **My local ERP data** and select the ERP data.
3. Browse and select the Service URL for the **online ERP data**.
4. Search data by the **Model Code** or the **Part number**.
5. Click **OK** to save the ERP settings and close HyDraw Options.

Note:

Refer Chapter 71, Para 2 for detailed configuration.

The screenshot shows the 'HyDraw Options' dialog box with the 'ERP Settings' tab selected. The dialog has a tabbed interface with tabs for 'Application', 'Units', 'Item ID', 'Connection', 'External Port', and 'Library Path'. Below these are sub-tabs: 'Misc.', 'Internet Settings', 'ERP Settings' (active), 'Gauge port', and 'Lists & Charts'. In the 'ERP Settings' tab, there are two radio buttons: 'My local ERP data' (selected) and 'Online ERP data'. Under 'My local ERP data', there is a text field for 'Excel file path' and a 'Browse ...' button. Under 'Online ERP data', there is a text field for 'Service URL'. Below these, there is a 'Search using' label followed by a text field and two radio buttons: 'Model code' (selected) and 'Part Number'. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

HyDraw Options – ERP Settings

9. Connection Tab

Customize line properties, line jumpers, line connections, and the recommended line weight in a drawing.

1. Click the **Connection** tab.
The Connection tab page displays.
2. In the **Line Properties** group box, choose the default pressure, tank, pilot, drain, or suction line.
You can also choose other lines with customized name typed in the text box.
3. Click the **Color** box to change the color.
4. Click the **Line Type** combo box to select the line pattern from continuous, phantom, and hidden.
5. Give the scale, layer and line type of the respective connection lines.
6. Set the recommended velocity for Pressure and Return Line.
7. In the **Line jumper** section, select the size of the jumper from large, medium, and small.
*In the Line connection section, select the size of the connection dot from large, medium, and small.
Connection dot is automatically inserted when one line terminates on another.*
8. Click the **Reset Line Properties** button if you want to reset all the values to default values from the database.
9. Click **OK** to apply and exit.

Name	Color	Line Type	Scale	Layer	Weight
Pressure	Red	Continuous	1	Pressure	0.002 inch
Tank	Blue	Continuous	1	Tank	0.002 inch
Pilot	Magenta	Hidden	0.5	Pilot	0.002 inch
Drain	Green	Hidden	0.5	Drain	0.002 inch
Suction	Cyan	Continuous	1	Suction	0.002 inch
Line1	Orange	Continuous	1	Line1	0.002 inch
Line2	Dark Green	Continuous	1	Line1	0.002 inch
Line3	Brown	Continuous	1	Line3	0.002 inch
Line4	Pink	Continuous	1	Line4	0.002 inch
Line5	Purple	Continuous	1	Line5	0.002 inch

Recommended velocity: Pressure line 10 ft/s, Return line 10 ft/s

Line jumper: ☐ None, Jumper size 0.03 inch

Line connection: Dot size 0.03 inch

Reset Line Properties, OK, Cancel

HyDraw Options – Connection Tab

10. Item ID

Enclose or balloon the envelope ID, external port ID, component ID, accessories ID, and hoses item ID.

1. Click the **Item ID** tab of HyDraw Options.
The Item ID tab displays.
2. Select the ISO numbering scheme or sequential numbering.
Enter the Item ID starting number and group identical items for the sequential numbering.
Select the separator and count, per requirement.
This helps in the identification of the component.
3. Select the **Same scheme as Components** option to enable hoses to follow the numbering scheme. Else, give the separate numbering scheme for hoses.
4. Select the **Display in drawing** checkbox in the Accessory Item ID section to display the accessory item ID in the drawing.
5. Select the **As sub item of component** checkbox to number the accessory same as the sub-item of the component.
6. Select **Separator** and **Accessories ID** to define the alphabetical accessory Item ID.
7. Select the **List component as first sub-item** checkbox to number the first sub-item
8. Select the **Balloon type** or select the **No balloons on external ports** checkbox, if you do not want any balloon on the external port ID.
9. Click **OK** to save and exit.

The screenshot shows the 'HyDraw Options' dialog box with the 'Item ID' tab selected. The dialog is divided into several sections: 'Components & Accessories', 'Hoses', 'Accessory Item ID', and 'Balloon Type'. In the 'Components & Accessories' section, 'Sequential Numbering' is selected, 'Item ID start with' is set to 1, 'Group identical items' is checked, and the separator is 'None' with an 'Alphabetic' count. The 'Hoses' section shows 'Same scheme as Components' is checked, 'Hose ID start with' is 'H1', 'Group identical items' is unchecked, and the separator is 'Dash (-)' with a 'Numeric' count. The 'Accessory Item ID' section has 'Display in drawing' checked, 'As sub item of component' is unchecked, the separator is 'Dash (-)', and the 'Accessory ID' is 'Numeric'. The 'Balloon Type' section shows a yellow circle icon selected, and 'No balloons on external ports' is checked. At the bottom right are 'OK' and 'Cancel' buttons.

HyDraw Options – Item ID Tab

11. Gauge Port

Configure the Gauge port settings.

1. Click the **Gauge port** tab of HyDraw Options.
The Gauge port tab page displays.
2. Configure the default gauge port type, size and prefix.
3. Set the **Gauge port insertion distance** default values in the External Port tab.
Else, set the locations in this tab.
4. Select the default symbols for the **Open** and **Close** options from the drop down.
5. Click **OK** to save and exit.

Note:

For more information refer chapter No.16.

The screenshot shows the 'HyDraw Options' dialog box with the 'Gauge port' tab selected. The dialog has a title bar with a close button. Below the title bar is a tabbed interface with tabs for 'Application', 'Units', 'Item ID', 'Connection', 'External Port', and 'Library Path'. The 'Gauge port' tab is active, showing sub-tabs for 'Misc.', 'Internet Settings', 'ERP Settings', 'Gauge port', and 'Lists & Charts'. The 'Configuration' section includes a 'Type' dropdown set to 'BSP', a 'Size' dropdown set to 'G 1 1/2 -11', and a 'Prefix' text box containing 'G'. The 'Location' section includes 'Distance from main port (X)' and 'Connection distance (Y)' text boxes, both set to '0.13' with 'inch' units, and a diagram showing a gauge port symbol with dimensions X and Y. The 'Symbol' section includes 'Open' and 'Close' dropdowns, each showing a symbol (an open circle and a closed circle with an X, respectively). At the bottom right are 'OK' and 'Cancel' buttons.

HyDraw Options – Gauge Port

Insert Symbols

The screenshot shows the HyDraw CAD800 software interface. The main window displays a hydraulic schematic with a circled '1' next to it. The left pane shows the 'HyDraw Library Explorer' with a 'Component Library' of hydraulic symbols. The right pane shows the 'HyDraw Property Manager' with a list of symbols and their descriptions.

Symb	Design	Mode	Access	Docu	CAD	Description
8						Insert Symbol
9						Insert External Port
10						Search Components
11						Search Sub-systems
12						Insert from Parts List
13						Insert Terminator
14						Insert Symbol Port
15						Insert Envelope
16						Insert Gauge Port

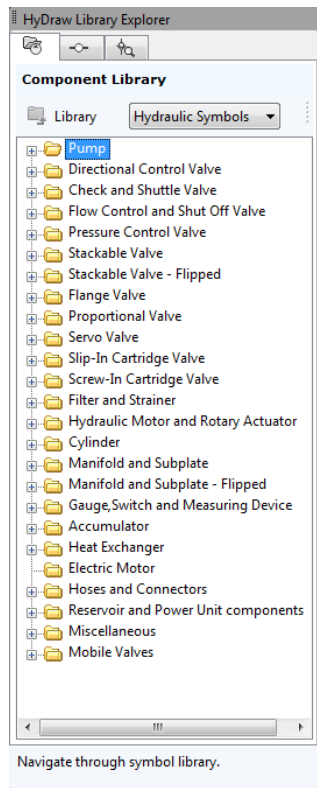
Command: *Cancel*

Type a command

8. Insert Symbol

The Insert Symbol command in the Circuit tab of the HyDraw® CAD ribbon menu enables you to insert symbols, external ports, and component models into the drawing.

The Component library is a logically structured symbol library of hydraulic, pneumatic, and electrical systems.



Logically structured Component Library

Insert a symbol into the drawing

1. Select the appropriate library and navigate to the required symbol.
2. Drag the symbol from the HyDraw Library Explorer window into the drawing.

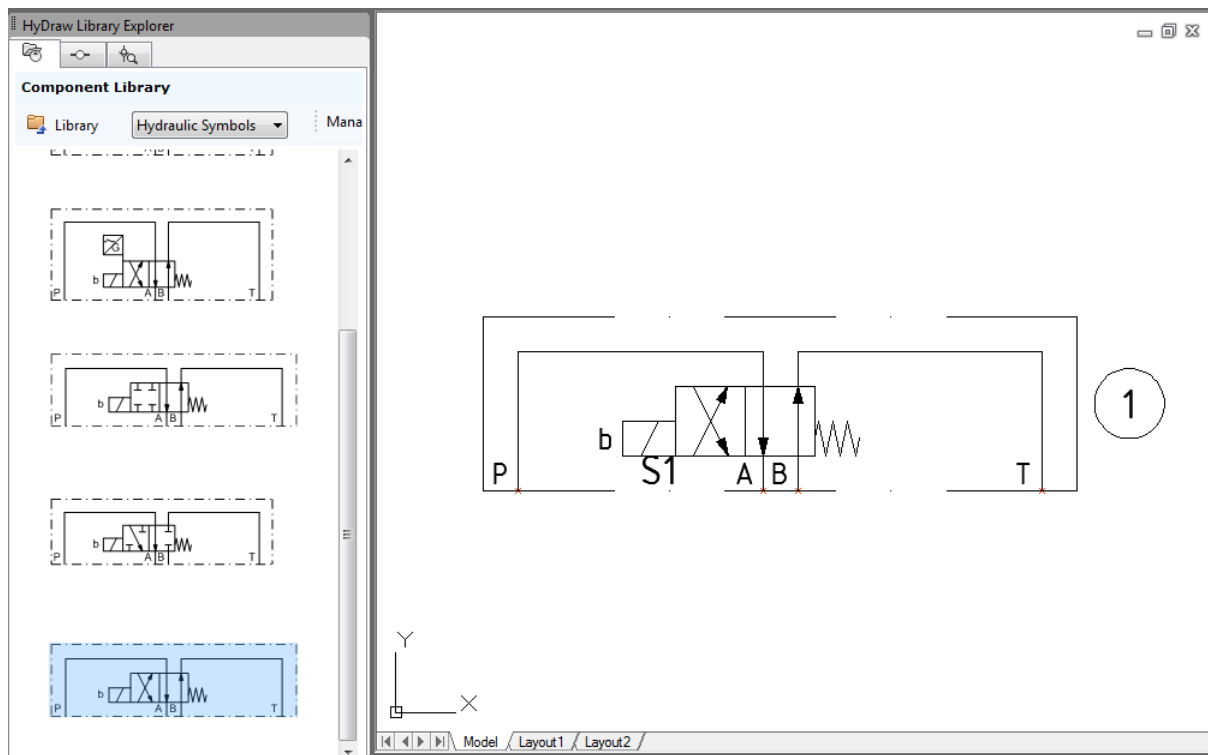
Alternatively,

3. Double click the symbol on HyDraw Library Explorer window.

Symbol preview appears on the drawing space.



The Specify insertion point prompt displays.

4. Specify the IP(Insertion Point),
The symbol is placed on the drawing.



*Double click or Drag and drop symbol
from Component Library into the drawing*

1. Pump Motor Adaptor Data - Select from Library

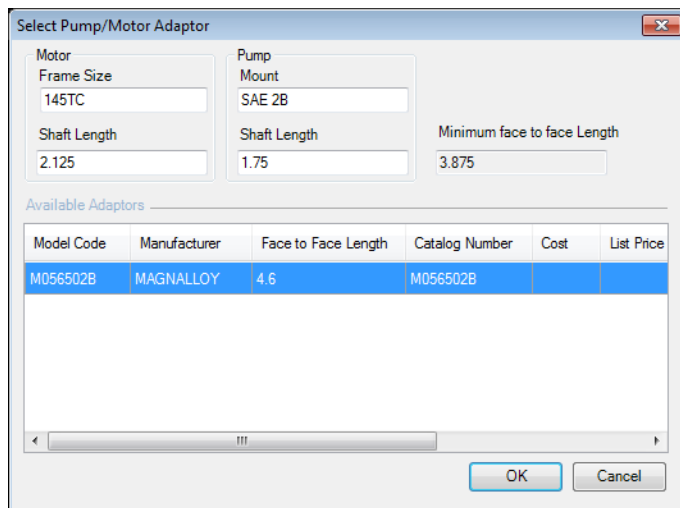
1. Click Circuit > **Edit**  on the HyDraw® CAD ribbon menu.
The HyDraw Property Manager window displays.
2. Select the adaptor.
The HyDraw Property Manager displays the properties of the adaptor.
3. Click  on the Model data caption bar to select the Model data from the library.
*The Pump/Motor Adaptor dialog box displays.
Automatically all the properties of the respective motor and pump populates and the most appropriate data is selected.*
4. Select the required adaptor.
5. Click **OK** to select the adaptor data from the library and populate in the Property Manager.

Note:

You can do an embedded search for a single Motor Frame Size and Pump Mount from a multiple values that are separated by slash (/).

e.g Motor Frame Size: 145TC/245TC/.. etc.

Pump Mount: SAE 2B/SAE 4B/.. etc.

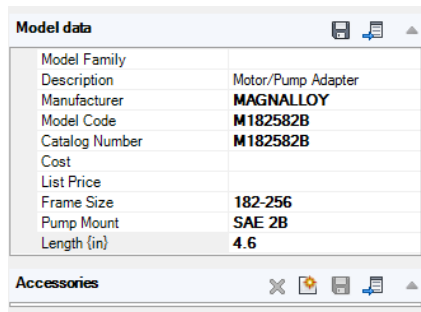


The dialog box titled "Select Pump/Motor Adaptor" contains input fields for Motor Frame Size (145TC), Pump Mount (SAE 2B), Shaft Length (2.125), and Minimum face to face Length (3.875). Below these fields is a table of available adaptors.

Model Code	Manufacturer	Face to Face Length	Catalog Number	Cost	List Price
M056502B	MAGNALLOY	4.6	M056502B		

At the bottom are OK and Cancel buttons.

Pump/Motor Adaptor Data



The "Model data" section of the Property Manager shows the following data:


Model Family	Motor/Pump Adapter
Description	
Manufacturer	MAGNALLOY
Model Code	M182582B
Catalog Number	M182582B
Cost	
List Price	
Frame Size	182-256
Pump Mount	SAE 2B
Length (in)	4.6

Below the table is an "Accessories" section with icons for adding, deleting, and saving items.

Property Manager: Model data

9. Insert External Port

*Insert ports on the envelope line in a circuit drawing.
Configure and edit the ports to suit the circuit requirements.*

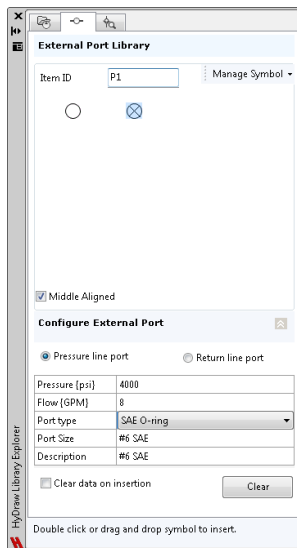
1. Click  tab on the HyDraw® Library Explorer window.
The External Port Library tab page displays.
2. Click on the Configure External Port caption bar to expand, if the section is not open.
3. Type the **Item ID** in the text box, for example, P, T, 1.
The default Item ID is '?'.
On selection, different port sizes of the respective port type are displayed automatically.
Choose the required one.
4. Select **Pressure line port** or **Return line port**.
5. Enter parameters for **Pressure** and **Flow**.
6. Select **Port Type** from SAE O-ring, SAE Flange, BSP, NPT, and Metric.

*On selection, different port sizes of the respective port type are displayed automatically.
Choose the required one.*

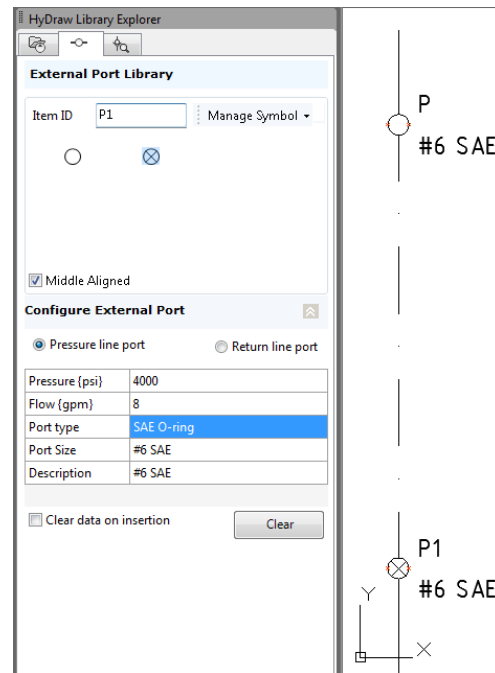
7. Select and drag the plugged or unplugged port from the preview section into the drawing.

Alternatively,
Double click the plugged or unplugged port.
The Specify insertion point displays on the command window.
Once you specify the insertion point, the port is inserted into the drawing.

If the port symbol is placed over the envelope line, it attaches itself to the envelope line.





External Port Library tab page



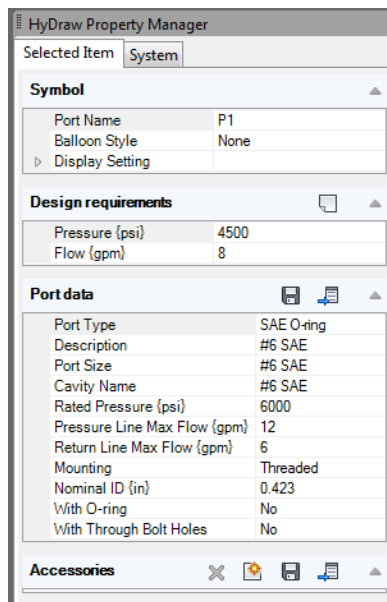
External Port inserted into the drawing

Port Data - Select from Library

1. Click Circuit > **Edit**  on the HyDraw® CAD ribbon menu.
The HyDraw Property Manager window displays.
2. Select the external port.
The HyDraw Property Manager displays the properties of the external port.
3. Click  on the Port data caption bar to select the port data from the library.
The Configure Port dialog box displays.
4. Select the Pressure line port/Return line port.
5. Select **Port Type** from the drop down: SAE O-ring, SAE Flange, BSP, NPT, and Metric.
On selection, different port sizes of the respective port type are displayed automatically.
Choose the required one.
6. Click **OK** to choose the selected port data from the library.

Note:

The port data can embed **With O-ring** and **With Through Bolt Hole** from HyDraw to MDTools®.



The image shows the 'HyDraw Property Manager' window with the 'System' tab selected. The 'Selected Item' is 'System'. The 'Symbol' section shows 'Port Name' as 'P1' and 'Balloon Style' as 'None'. The 'Design requirements' section shows 'Pressure (psi)' as '4500' and 'Flow (gpm)' as '8'. The 'Port data' section shows 'Port Type' as 'SAE O-ring', 'Description' as '#6 SAE', 'Port Size' as '#6 SAE', 'Cavity Name' as '#6 SAE', 'Rated Pressure (psi)' as '6000', 'Pressure Line Max Flow (gpm)' as '12', 'Return Line Max Flow (gpm)' as '6', 'Mounting' as 'Threaded', 'Nominal ID (in)' as '0.423', 'With O-ring' as 'No', and 'With Through Bolt Holes' as 'No'. The 'Accessories' section is empty.

Symbol	
Port Name	P1
Balloon Style	None
Display Setting	

Design requirements	
Pressure (psi)	4500
Flow (gpm)	8


Port data	
Port Type	SAE O-ring
Description	#6 SAE
Port Size	#6 SAE
Cavity Name	#6 SAE
Rated Pressure (psi)	6000
Pressure Line Max Flow (gpm)	12
Return Line Max Flow (gpm)	6
Mounting	Threaded
Nominal ID (in)	0.423
With O-ring	No
With Through Bolt Holes	No

Accessories	
-------------	--

HyDraw Property Manager – Port

Configure External Port

You can configure different external ports shape.

1. Click  from the HyDraw® CAD ribbon menu.
2. Click the **External Port** tab.

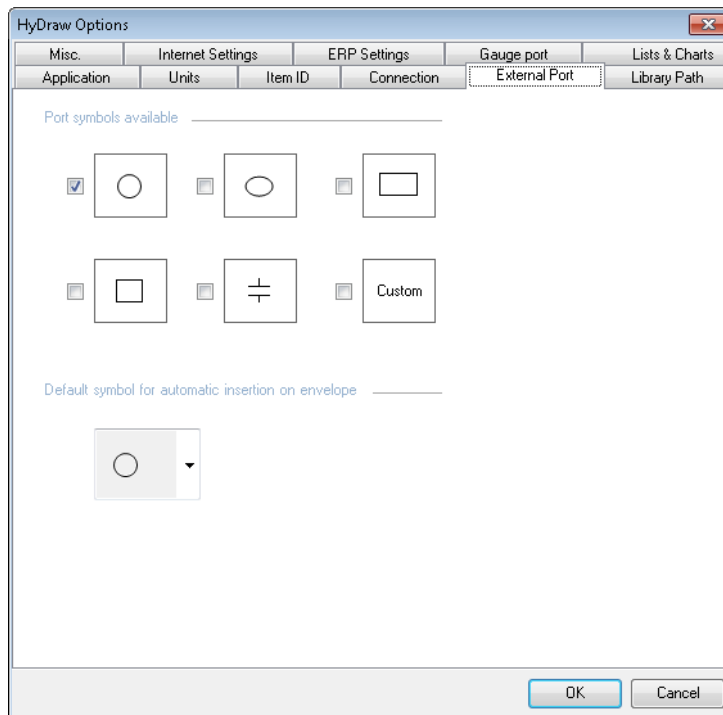
The External Port tab page displays.

3. Select the appropriate port shape, such as circle, oval, line, rectangle, or square.

The respective shape displays in the Port Preview section of the HyDraw Library Explorer window.

The external port can be placed on the envelope line of the circuit.

4. Click **OK** to apply and exit.




External Port tab

10. Search Components

The Search from Library feature is used to search a component or sub-system from the library.

You can search the Model Family/Model Code of a component type/category of a particular manufacturer/different manufacturers.

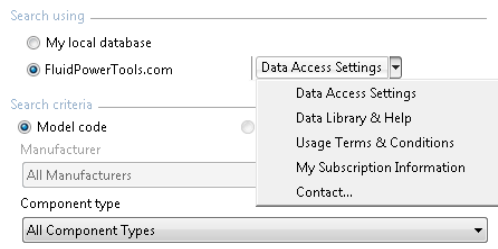
Search Components

1. Click  tab on the HyDraw® Library Explorer window.
The Search From Library tab page displays.
2. Select **Components**.
3. Select an appropriate application.
4. Select appropriate search database, My local database or FluidPowerTools.com database.

If the My local database option is selected, the program searches components in the user's local database.

If the FluidPowerTools.com database option is selected,

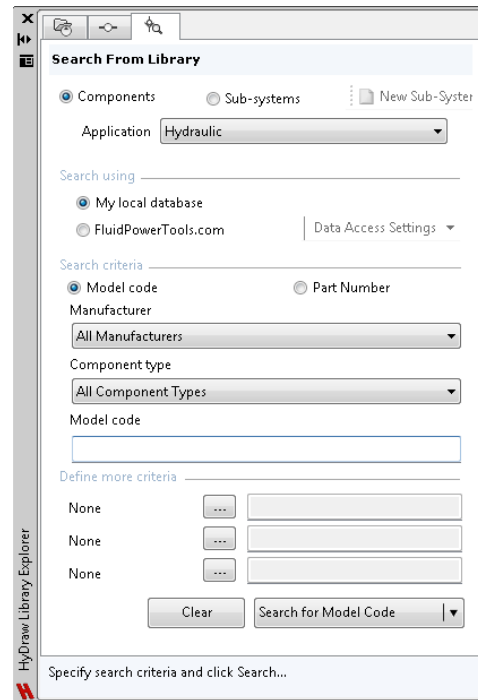
In Data Access Settings, select the manufacturer database to search for the components.



Data Access Settings

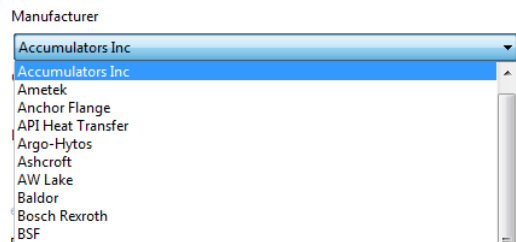
The Data Access Settings drop down provides other controls, which includes:

- Data Access Settings
- Data Library & Help
- Usage Terms & Conditions
- My Subscription Information
- Contact...



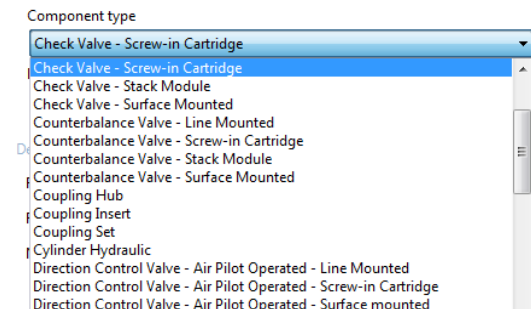
Default Search tab page

5. Select the manufacturer from the drop-down list, if *My local database* is selected.



Manufacturer options

6. Select the appropriate component type.



Component type options

7. Enter the Model Code to search a particular component.

Search criteria

☒ Model code ☐ Part Number

Manufacturer
All Manufacturers

Component type
All Component Types

Model code

Enter Model Code

8. Define more criteria

Define more criteria

Rated Flow(gal/sec)

Rated Pressure(psi)

None

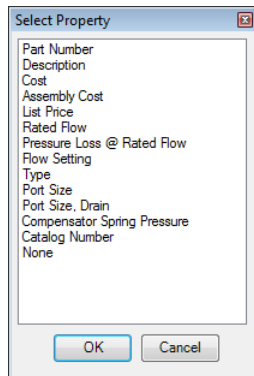
Define More Criteria options

- 8.1 For precise search, define custom search parameters in the Define more criteria section.
- 8.2 Click to view the Select Property box, which displays common properties.
- 8.3 Select the property you want to assign.

- 8.4 Enter the property value, for example 10,
or range, for example 10-20.

Property range must be separated by a hyphen (-).

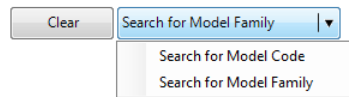
9. Select Property



Select Property

10. Click the Search for Model Code button.

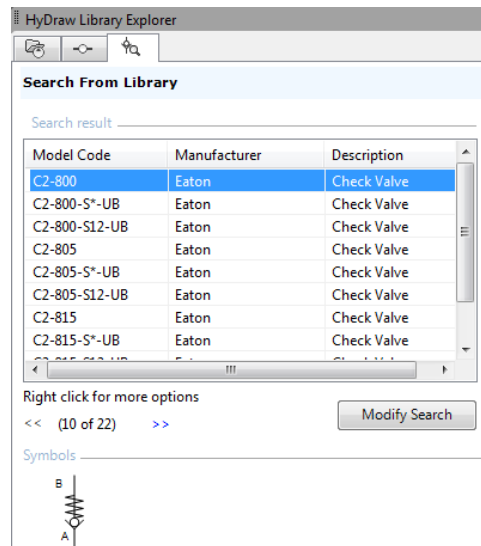
*All model codes with the assigned custom properties are displayed
in the Search results pane.*



Search Model code with precise criteria

11. Select the appropriate model code in the preview pane.

The Search results are displayed in the pane.

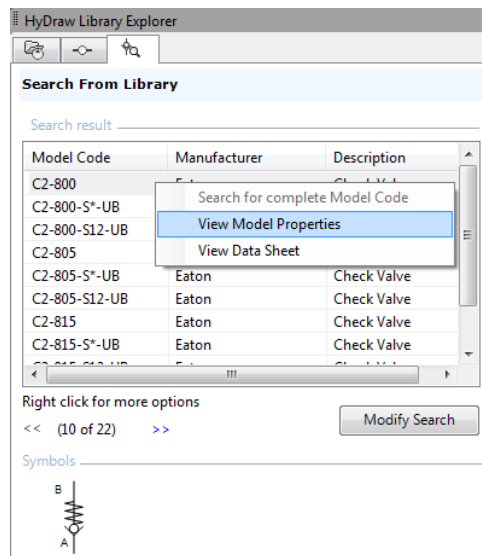


Preview symbols

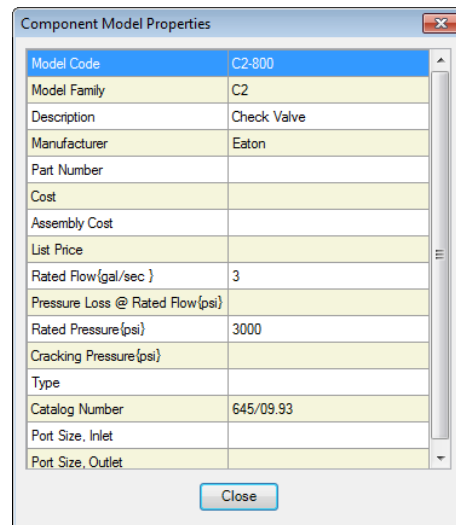
Right click and select **View Model Properties** from the context menu to display the component data window.

*The **Component Model Properties** window displays details about the component.*

Right click and select **View Data Sheet** from the context menu to view the data sheet attached to the model code.



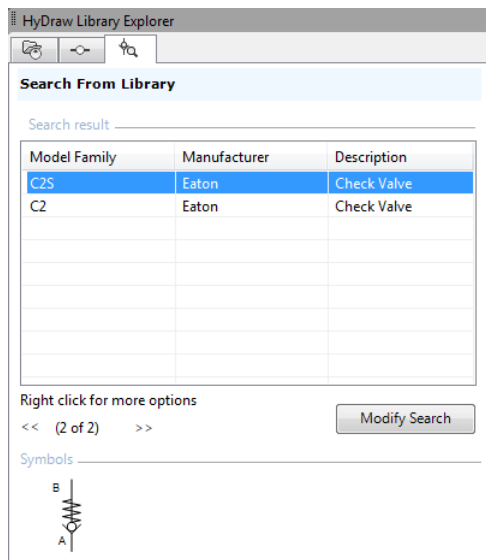
Model code context menu



Component data

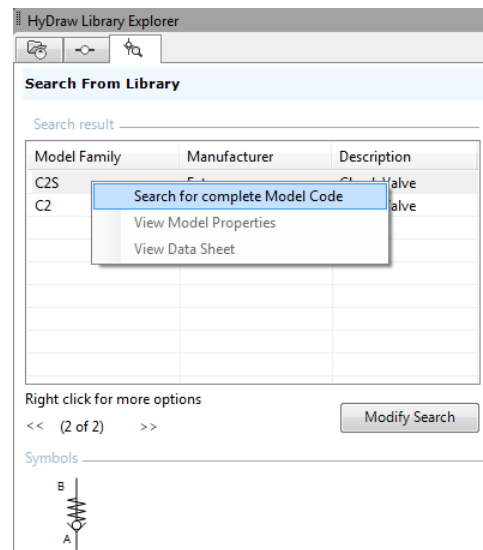
12. Click Search for **Model Family**.

All model families with assigned custom properties are displayed in the Search results pane.



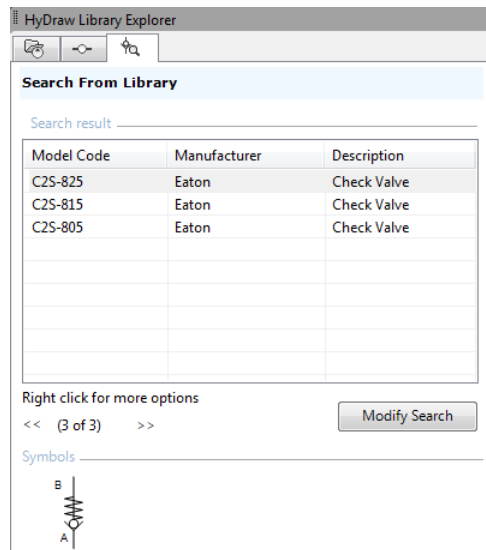
Model Family search results

13. Right click and select **Search for complete Model Code** from the context menu to display all model codes in the model family.



Model Family context menu

14. Click **Modify Search** to return to the main search window and search with different inputs, if required.

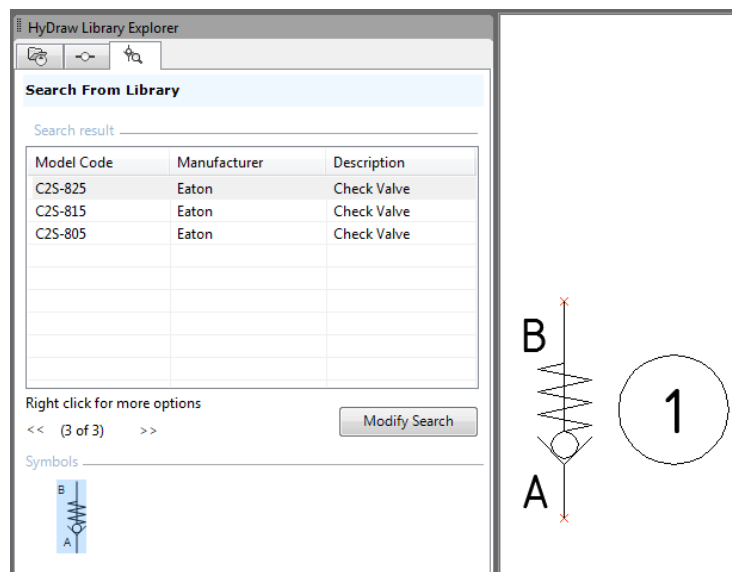


Modify Search

15. Select the symbol in the preview pane; drag and drop. Alternatively, double click the symbol to insert the symbol into the drawing.


The Specify insertion point prompt displays.

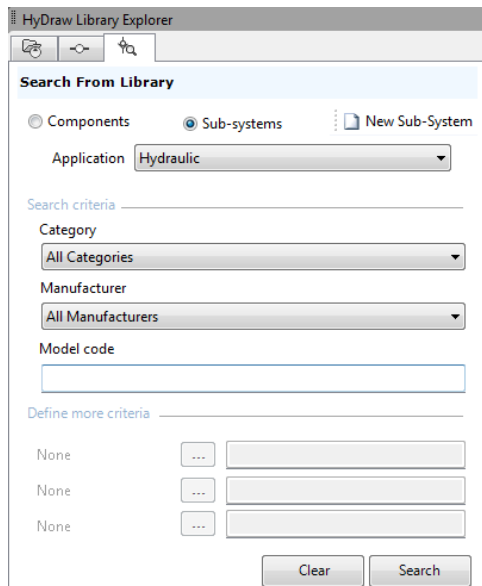
16. Specify IP (Insertion Point) on the drawing and the symbol is inserted.



Symbol dragged and dropped into the drawing

11. Search Sub-systems

1. Click  tab on the HyDraw® Library Explorer window.
The Search From Library tab page displays.
2. Select **Sub-systems**.
3. Select the appropriate application.



HyDraw Library Explorer

Search From Library

☐ Components ☒ Sub-systems

Application Hydraulic

Search criteria

Category All Categories

Manufacturer All Manufacturers

Model code

Define more criteria

None ...

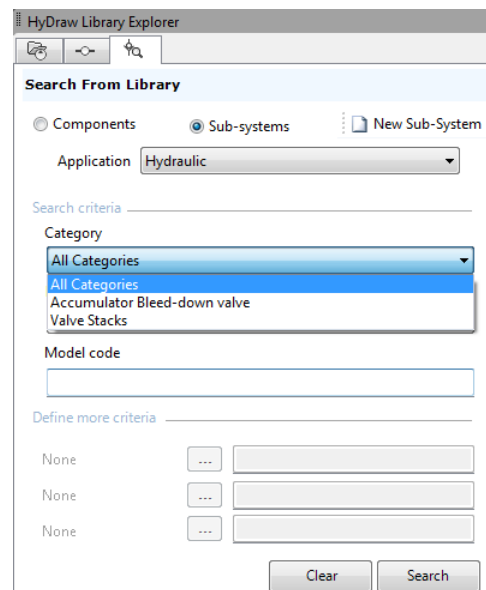
None ...

None ...

Clear Search

Sub-systems tab page

4. Select the appropriate category.



HyDraw Library Explorer

Search From Library

☐ Components ☒ Sub-systems

Application Hydraulic

Search criteria

Category All Categories

Model code

Define more criteria

None ...

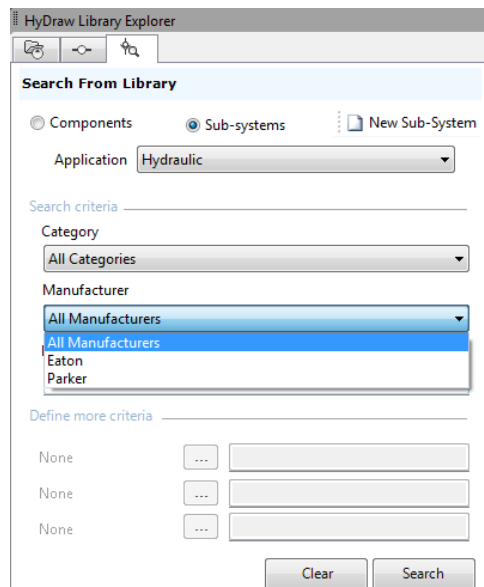
None ...

None ...


Clear Search

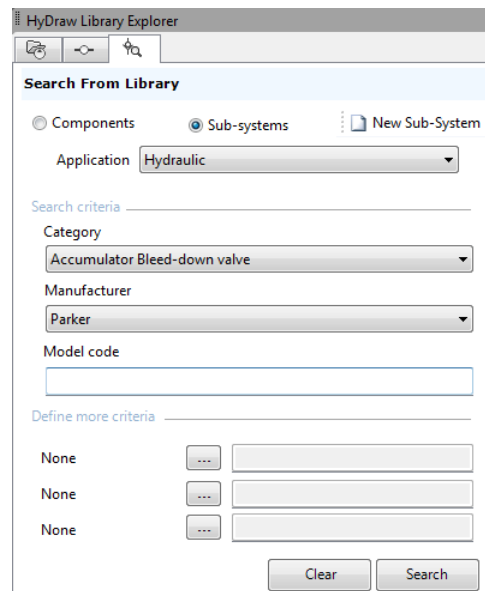
Category options

5. Select the appropriate manufacturer.

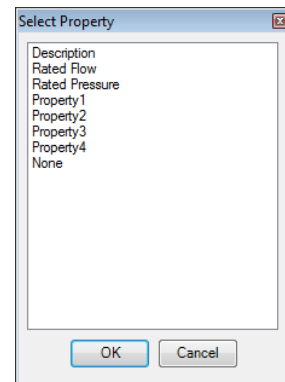


Manufacturer options

6. Enter the Model Code to search the particular component
- For precise search, define custom search parameters in the Define more criteria section.
 - Click  to view the Select Property box, which displays common properties.
 - Select the property you want to assign.
 - Click OK.



Searching model code with precise criteria

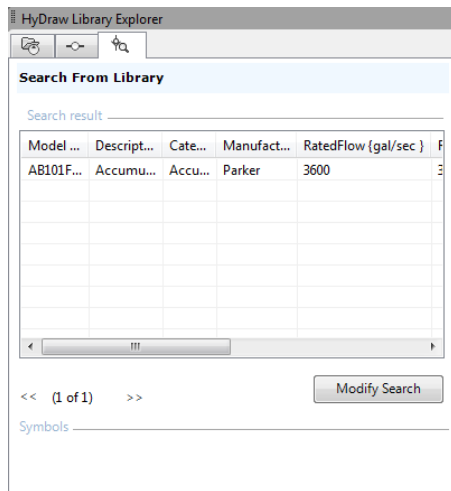


Select Property

7. Click the **Search** button.

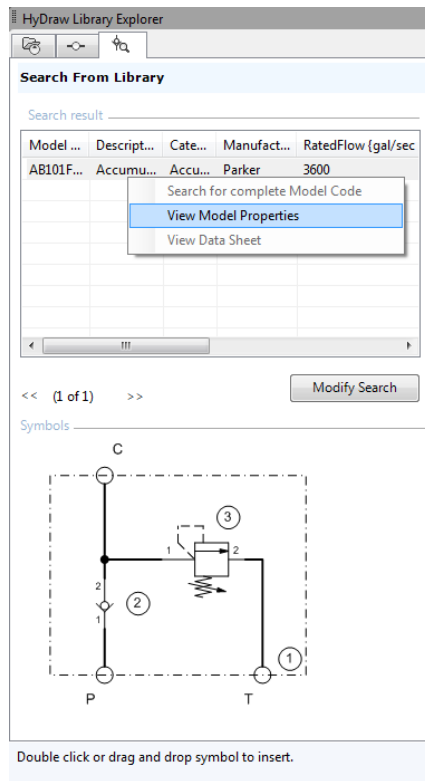
All sub-systems with assigned custom properties display in the Search results pane.

8. Click on the search results to display the selected sub-system in the preview pane.



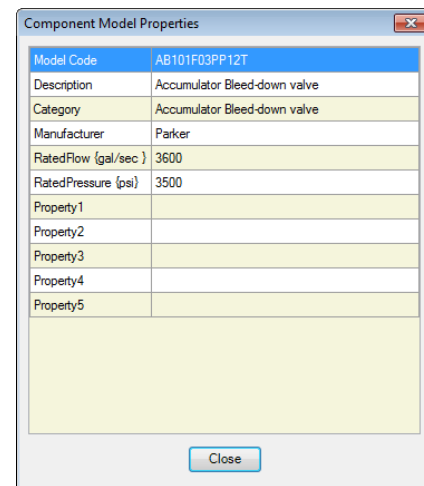
Search Model Code

9. Right click and select **View Model Properties** from the context menu to display the component data window.



View Model Properties

The Component Model Properties window display details about the sub-system.

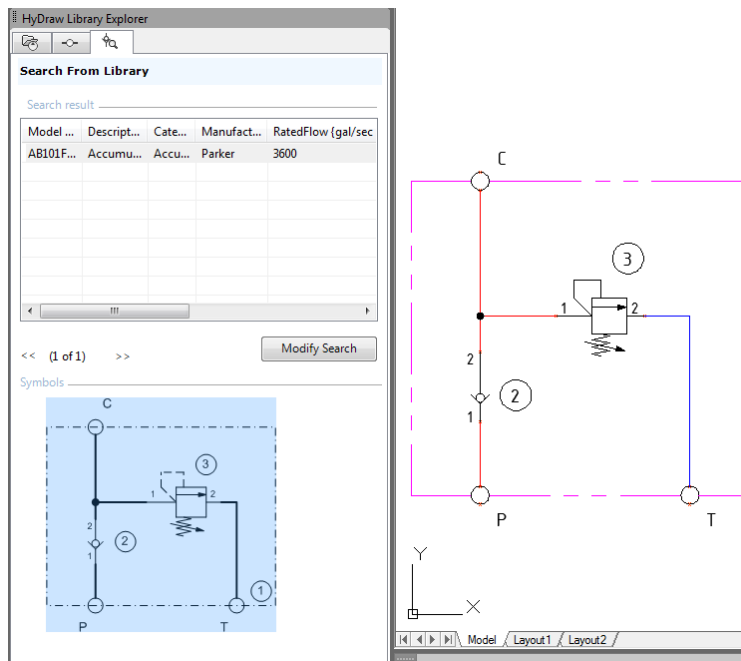


Component Model Properties

10. Select the sub system in the preview pane; drag and drop it into the drawing. Alternatively, double click the symbol.

The Specify insertion point prompts displays.

11. Specify IP (Insertion Point) on the drawing and the symbol is inserted.



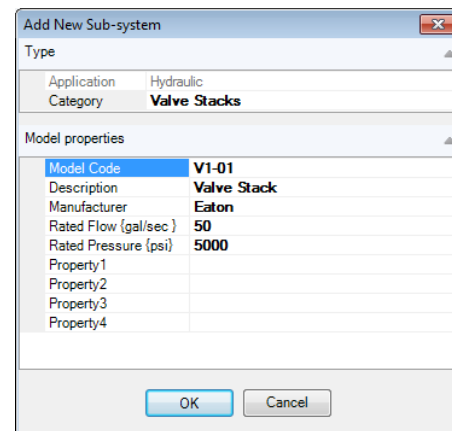
Sub-system dragged and dropped into the drawing

12. Insert a New Sub System

You can add a new sub system by clicking the **New Sub System** link on the search page.

- Enter the New Sub-system properties.
- Click OK.
- Select the Sub-system from the drawing and provide the insertion point.

The selected Sub system is saved in the HyDraw library.



Add New Sub-system

12. Insert from Parts List

The *Insert from Parts List* feature enables you to insert symbols from Parts List in Excel.

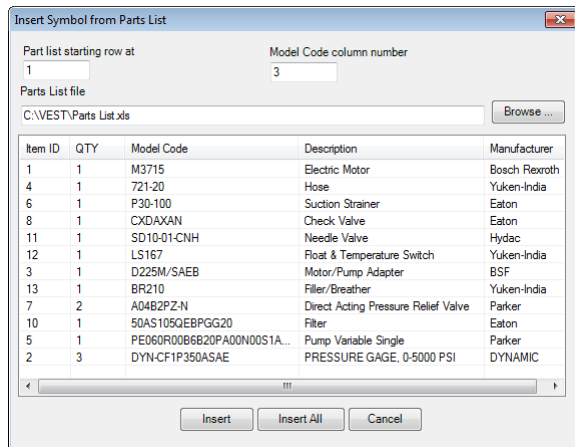
Each item in the Parts list is identified by its unique model code. Therefore, the Parts list must contain a model code for each item in the list.

1. Select **Circuit > From Parts List** from the Insert Symbol option on the HyDraw® CAD ribbon menu.

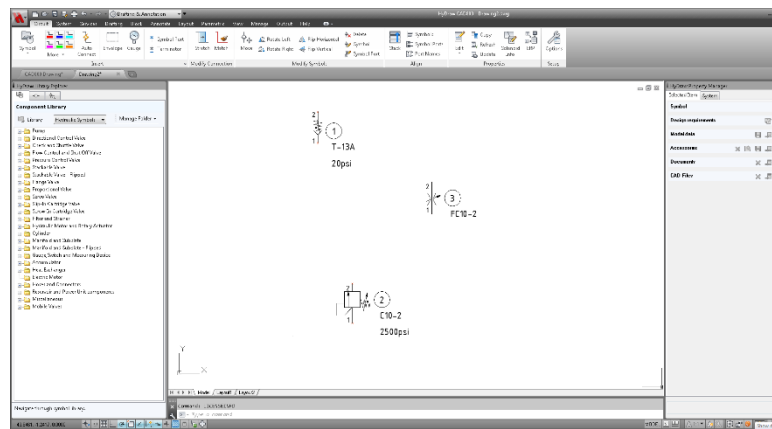
The *Insert Symbol from Parts List* dialog box displays.

2. Enter the **Part list starting row at** option and the **Model Code column number**.
3. Click **Browse...**

The *Select Parts List Excel file* dialog box displays.



Insert Symbols From Parts List dialog box




Symbols inserted in the drawing from Parts List

4. Select the required Excel file containing the Parts list and click **Open**.
Contents of the Excel file are displayed.
5. Type **Model Code column number** in the textbox, if it is not automatically entered.
6. Select the symbols and click **Insert** or **Insert All** to insert all the symbols into the drawing.

13.Insert Terminators

Insert terminators dynamically for any unused component ports and connection lines.

1. Click Circuit >**Terminator**  from the HyDraw® CAD ribbon menu.

The Select symbol port prompt displays.

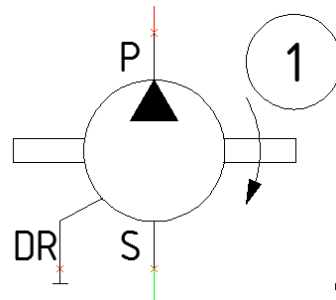
2. Select the symbol port for the terminator insertion.

The terminator is inserted at the location.

Terminators are inserted automatically for all unused ports of all selected symbols and unused connection lines.

Note:


- The terminator indicates the unused component port.
- Terminator is essential in the Net List creation. A net remains incomplete, if a port is left unconnected.
- The Net list can indicate unconnected circuit lines and ports.
- When you rotate the symbol, the terminator also rotates along with it.

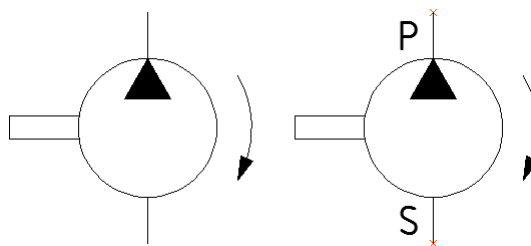


Dynamic terminators

14.Insert Symbol Port

Insert connection points on the ports of a symbol.


1. Click Circuit > **Insert Symbol port**  on the HyDraw® CAD ribbon menu.
The Select Symbol to Insert Port prompt displays.
2. Select the symbol.
The Port Name: prompt displays.
3. Enter the Port Name in the command window and press the **Enter** key.
The Other Name: prompt displays.
4. Enter the other name in the command window, if required and press the **Enter** key.
The Specify Port Insertion Point: prompt displays.
5. Specify the Port Insertion point on the symbol.
A small red cross appears at the point where the port is inserted.



Inserting a Symbol Port

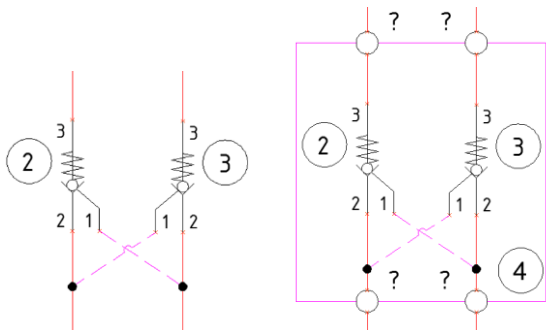
15. Insert Envelope

Insert an envelope to define a boundary for a manifold or a system.

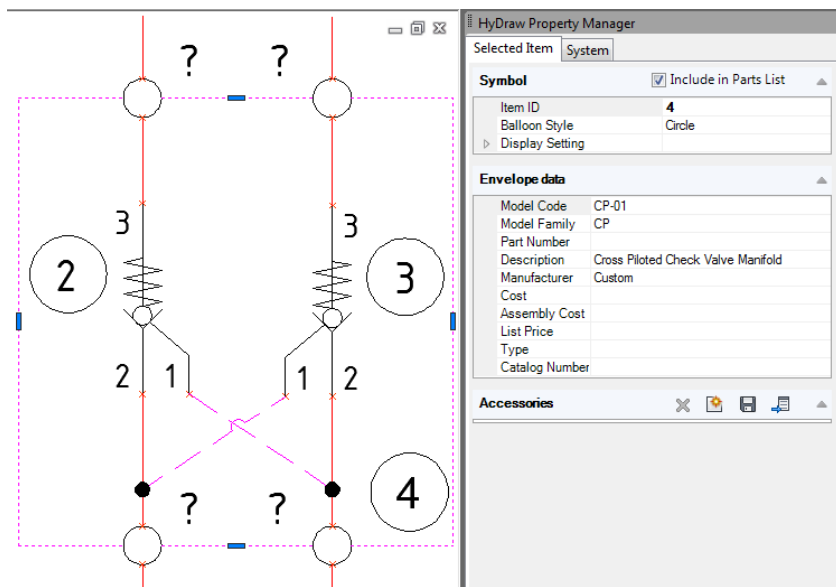
1. Click Circuit >  **Envelope** from the HyDraw® CAD ribbon menu.
The Specify first corner point prompt displays.
2. Select the first corner point on the drawing.
The Specify other corner point prompt displays.
3. Select the other corner point on the drawing.
The envelope is inserted.

The smart envelope has following functionalities:

- a. Insert ports automatically on the envelope line intersection with connection lines.



Ports automatically inserted on envelope line intersection




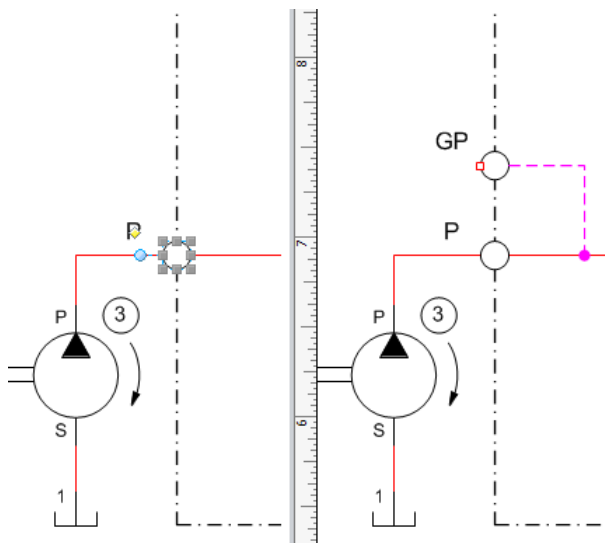
Envelope data of the selected Envelope Line

- b. Envelope line is made of polyline and can be easily resized by the resize handle.
- c. External ports are glued to the envelope and relocates the ports and maintain connectivity while resizing the envelope.
- d. Envelope data is attached to the envelope line.

16.Insert Gauge Port

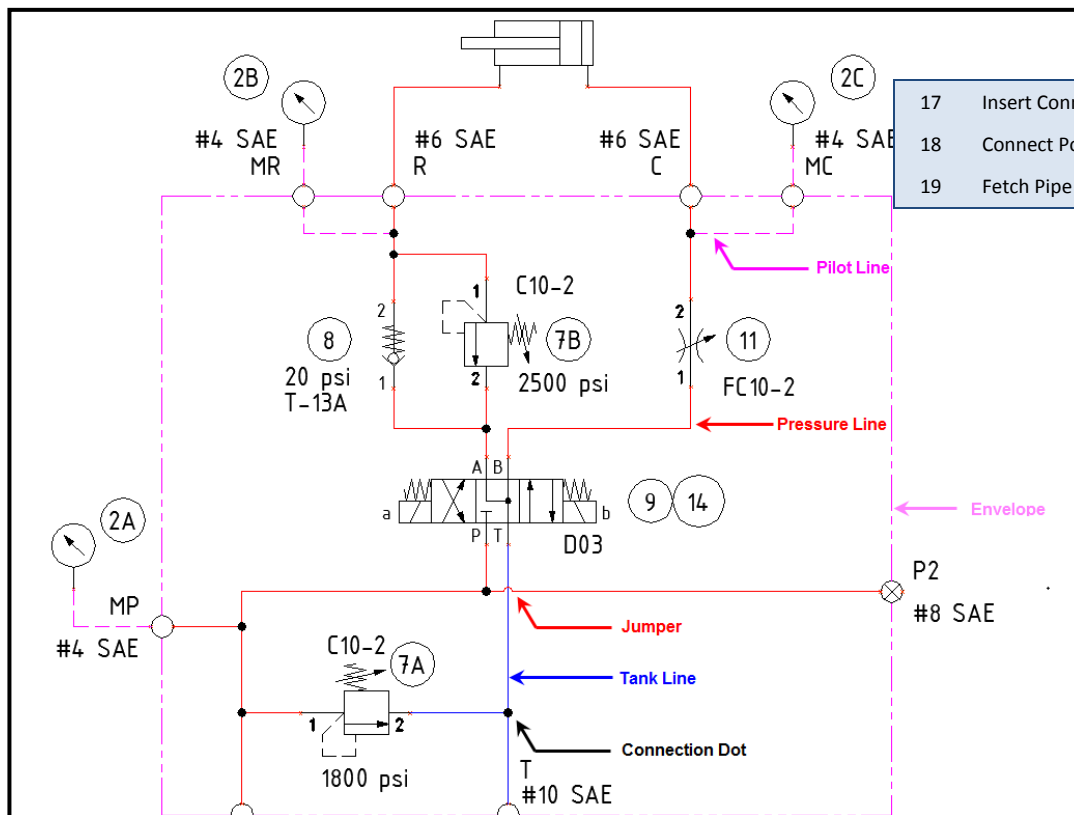
Insert a gauge port to define a boundary for a manifold or a system.

1. Click Circuit >  Gauge from the HyDraw® CAD ribbon menu.
Prompt to select symbols.
2. Select the external port(s) on the drawing.
The Port type (Open/Close) prompt displays.
The default symbol also displays.
The insertion location [Above/Below/Left/Right] prompt displays.
HyDraw inserts the gauge ports for all the selected external ports and automatically inserts Item ID and connects using the connection line.
3. To configure the gauge port, select the Gauge tab option.



Gauge port GP is inserted in parallel to the existing selected external port

Make Connections



- 17 Insert Connection
- 18 Connect Ports and Symbols
- 19 Fetch Pipe and Tube Data

17.Insert Connection

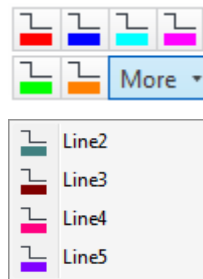
Interconnect symbols and create a circuit.

Auto Connect: *The Auto Connect property, when enabled before making a connection, automatically creates the connection between the two selected points.*

When the Auto Connect property is disabled, the connection has to be created manually between the selected points. When Ortho is ON, the termination point can be selected only in the four mutually perpendicular directions of the starting point. When Ortho is OFF, the termination point can be anywhere around the start point.

1. Enable/Disable **Auto Connect** on the HyDraw® CAD ribbon menu.
2. Click on the Connection type from Pressure, Tank, Pilot, Drain, Suction, or Custom from Line1, Line2, Line3, Line4, and Line5 options on the HyDraw CAD ribbon menu.

Connection lines are assigned with the default ISO color and line weight. You can customize the connection lines.



Insert Connection sub menus

The Select first connection point prompt displays.

3. Select the first connection point on the drawing as the start point.

When the Auto Connect option is enabled:

The Select second connection point prompt displays.

4. Select the second connection point as the termination point.

When the Auto Connect option is disabled:

The Select Next point prompt displays.

5. Select the next connection point.
6. Press the **Enter** key when the connection is complete.
The connection line is drawn between the two points.
7. Customize the connection lines, if required.

18. Connect Ports and Symbols

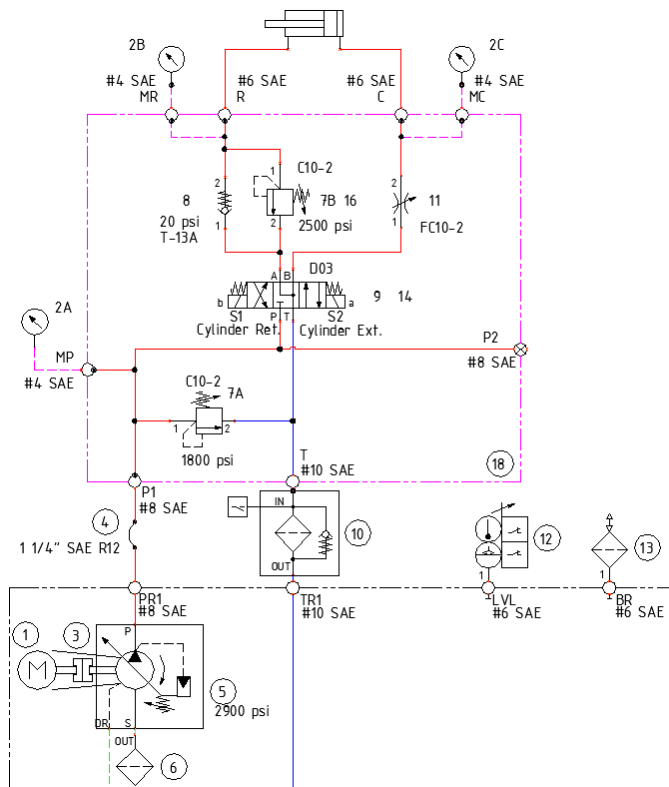
To connect two ports of different symbols, click one port of a symbol and then click the other port.

When two lines cross each other, a jumper is inserted over one line dynamically. This indicates the connection is not ended.

When one line terminates on another, a connection dot is inserted dynamically at the termination point.

Note:

- To insert jumpers automatically for non-intersecting connection lines, set the option in the Misc. tab of the HyDraw® Options ribbon menu.
- Connection dots are inserted automatically when one connection line terminates on the other.



Connection lines inserted to create circuit

19.Fetch Pipe and Tube Data

Connection lines can be assigned to the Tube and Pipe data from the library, based on the design requirements.

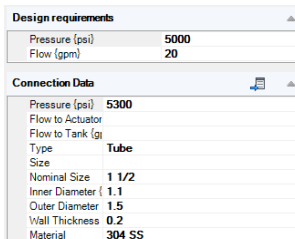
1. Select the **connection line**.
2. Specify the **design requirements, pressure and flow** for the selected connection lines in the HyDraw[®] Property Manager.
3. Click the **Select from Library** icon.
The Fetch Pipe/Tube from Library dialog box displays.
4. Select either **Pressure line** or **Return line**.
5. Select **Type**, i.e. Pipe/Tube.
6. Select **Material**.

Pressure and flow are automatically displayed in the Design requirements section.

Velocity is displayed per the recommended velocity set in the HyDraw Options dialog box.

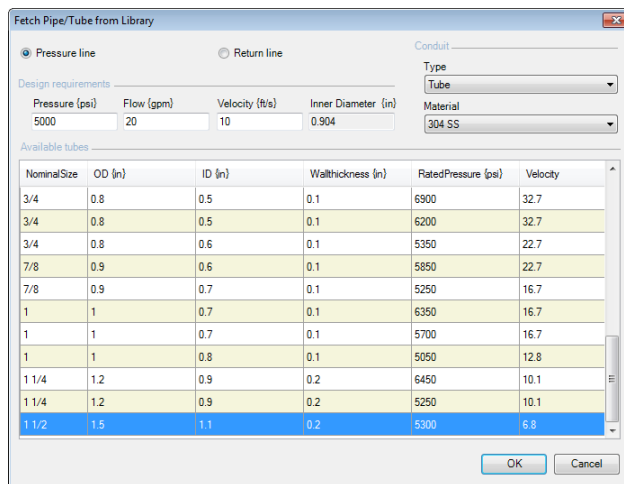
The inner diameter is based on the flow and velocity, and the appropriate pipe/tube is selected by default in the grid displaying all the other available pipes/tubes with velocity.

7. Select the required pipe or tube.
8. Click **OK** and exit.



The dialog box is divided into two sections. The top section, 'Design requirements', has fields for Pressure (psi) set to 5000 and Flow (gpm) set to 20. The bottom section, 'Connection Data', has fields for Pressure (psi) set to 5300, Flow to Actuator, Flow to Tank (g), Type set to Tube, Size, Nominal Size set to 1 1/2, Inner Diameter (in) set to 1.1, Outer Diameter set to 1.5, Wall Thickness set to 0.2, and Material set to 304 SS.

HyDraw Property Manager – Connection Data



The dialog box has two tabs: 'Pressure line' (selected) and 'Return line'. It includes a 'Conduit' dropdown set to 'Type'. Below this is a 'Design requirements' section with fields for Pressure (psi) set to 5000, Flow (gpm) set to 20, Velocity (ft/s) set to 10, and Inner Diameter (in) set to 0.904. A 'Material' dropdown is set to '304 SS'. The main area is a table titled 'Available tubes' with columns: Nominal Size, OD (in), ID (in), Wall thickness (in), Rated Pressure (psi), and Velocity. The table lists various pipe sizes, with the 1 1/2 inch size highlighted in blue. At the bottom are 'OK' and 'Cancel' buttons.

Nominal Size	OD (in)	ID (in)	Wall thickness (in)	Rated Pressure (psi)	Velocity
3/4	0.8	0.5	0.1	6900	32.7
3/4	0.8	0.5	0.1	6200	32.7
3/4	0.8	0.6	0.1	5350	22.7
7/8	0.9	0.6	0.1	5850	22.7
7/8	0.9	0.7	0.1	5250	16.7
1	1	0.7	0.1	6350	16.7
1	1	0.7	0.1	5700	16.7
1	1	0.8	0.1	5050	12.8
1 1/4	1.2	0.9	0.2	6450	10.1
1 1/4	1.2	0.9	0.2	5250	10.1
1 1/2	1.5	1.1	0.2	5300	6.8

Fetch Pipe/Tube from Library

Modify Connection

HyDraw CAD800 CAD800 Drawing.dwg

Symbol Port Envelope Gauge Terminator Stretch Match Move Rotate Left Rotate Right Flip Horizontal Flip Vertical Delete Symbol Symbol Port Stack Edit Refresh Update Copy Solenoid Info ERP Options

Insert Modify Connection Modify Symbols Align Properties Setup

CAD800 Drawing* x

20 Stretch Connections
21 Match Connections
22 Reset Connections

ITEM ID	QTY	MODEL CODE	DESCRIPTION
1	1	PD75	Electric Motor
2	3	DYN-CF-P350 ASAE	Pressure Gauge
3	1	D225M/SAEB	Motor/Pump
4	1	Z21-20	Hose
5	1	PD60R00B6620FA00N0051A1U	Pump Variable
6	1	P30-100	Suction Strainer
7	2	A04B2P2-N	Direct Acting Pressure Relief Valve
8	1	CXDAXAN	Check Valve
9	1	4WE6.6 X/EW230N9K4	Direction Control Valve
10	1	50AS1050BPGG20	Filter
11	1	SD10-01-0NH	Needle Valve
12	1	LS167	Float & Temperature Switch
13	1	BR210	Filter/Breather
14	1	R901017022	Block Matching Connector

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
BR, C, LVL, R	SAE 0-rmg	#6 SAE	#6 SAE
MC, MP, MR	SAE 0-rmg	#4 SAE	#4 SAE
P1, P2, PR1	SAE 0-rmg	#8 SAE	#8 SAE
T, TR1	SAE 0-rmg	#10 SAE	#10 SAE

NET NAME	NET LIST	FUNCTION	9-S1	9-S2
NET-1	MC, C, 11-2	Cylinder Ext.	<input type="radio"/>	<input type="radio"/>
NET-2	T, 7A-2, 9-T	Cylinder Ret.	<input type="radio"/>	<input type="radio"/>
NET-3	MP, P2, P1 7A-1, 9-P		<input type="radio"/>	<input type="radio"/>
NET-4	MR, R, 7B-1, 8-2		<input type="radio"/>	<input type="radio"/>
NET-5	11-1, 9-B		<input type="radio"/>	<input type="radio"/>
NET-7	7B-2, 8-1, 9-A		<input type="radio"/>	<input type="radio"/>

VECT


Cylinder Control

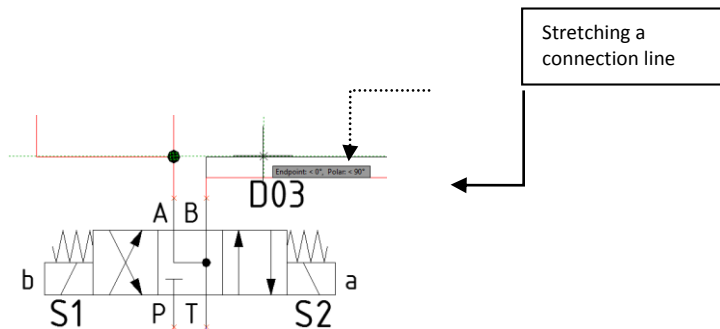
12.2140, 11.1119, 0.0000

MODEL 1:1

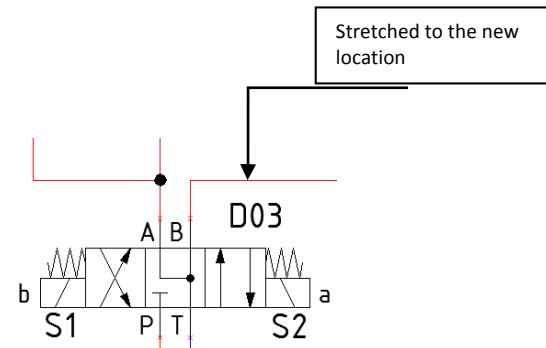
20.Stretch Connections

Stretch an existing connection line.

1. Click Circuit > **Stretch Connection**  on the HyDraw® CAD ribbon menu.
The Select a connection prompt displays.
2. Select a connection line.
The Specify point prompt displays.
3. Click a point on the drawing to specify the new location of the connection line.
The connection line gets stretched.




Stretching the connection

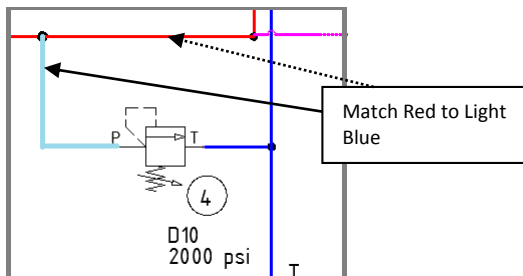


Circuit after Stretching the connection

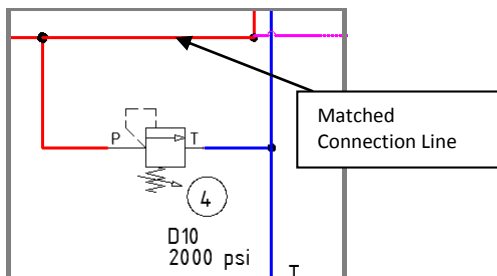
21.Match Connections

Match the connection properties of one connection line with another.

1. Click Circuit > **Match Connection**  on the HyDraw® CAD ribbon menu.
The Select Source Connection prompt displays.
2. Select the source connection line.
The Select Destination connection(s) prompt displays.
3. Select a single line or multiple connection lines.
4. After completion of selection, press the **Enter** key.
The connection properties are copied.



*Circuit Before Matching Suction Connection line
with Pressure Connection Line*

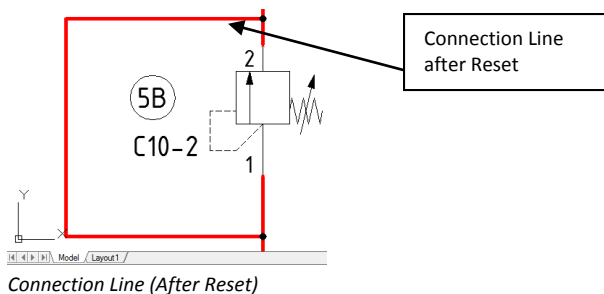
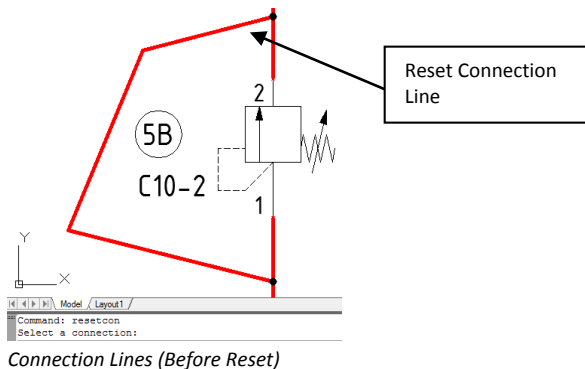


Circuit After Matching Connection

22.Reset Connections

Convert a bend (slanting) connection line in to a right angled connection line.

1. On the command window (line), type the **Resetcon** command.
The Select a connection prompt displays.
2. Select the connection line that you want to reset.
The connection line resets to the right angled connection line.



Specify Properties

HyDraw CAD800 - CAD800 Drawing.dwg

Circuit System Services Drafting Block Annotate Layout Parametric View Manage Output Help

Symbol More Auto Connect Envelope Gauge Symbol Port Terminator Stretch Match Move Rotate Left Rotate Right Flip Horizontal Flip Vertical Delete Symbol Symbol Port Stack Symbol Ports Port Names Edit Refresh Update Soleenoid Info ERP Options

Insert Modify Connection Modify Symbols Align Properties Setup

CAD800 Drawing*

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
BR, C, LVL, R	SAE O-ring	#6 SAE	#6 SAE
MC, MP, MR	SAE O-ring	#4 SAE	#4 SAE
P1, P2, PR1	SAE O-ring	#8 SAE	#8 SAE
T, TR1	SAE O-ring	#10 SAE	#10 SAE

NET NAME	NET LIST	FUNCTION	9-S1	9-S2
NET-1	MC, C, 11-2	Cylinder Ext.	<input type="radio"/>	<input type="radio"/>
NET-2	T, 7A-2, 9-T	Cylinder Ret.	<input type="radio"/>	<input type="radio"/>
NET-3	MP, P2, P1, 7A-1, 9-P			
NET-4	MR, R, 7B-1, 8-2			
NET-6	11-1, 9-B			
NET-7	7B-2, 8-1, 9-A			

Frequency 50
Bolt Shoulder Height (in) 1.4
Installation Torque (Steel) 5.9 lb ft/8 Nm
Installation Torque (Alum) 5.9 lb ft/8 Nm
Catalog Number RE 23178/08.08

Accessories
14 (R901017022)

Documents
Set Item ID of the selected item

Command:
Type a command

5.9361, 9.5596, 0.0000

MODEL

- 23 Selected Item Properties
- 24 System Properties
- 25 Edit Properties
- 26 Copy Properties
- 27 Refresh Properties
- 28 Update Property List
- 29 Show/Hide Properties
- 30 Purge Properties
- 31 Purge Price Data
- 32 ERP Interface

23. Selected Item Properties


The *Selected Item* tab page displays the properties assigned to the selected symbol in the drawing.
You can also add new accessories to the symbol and save it to the library.

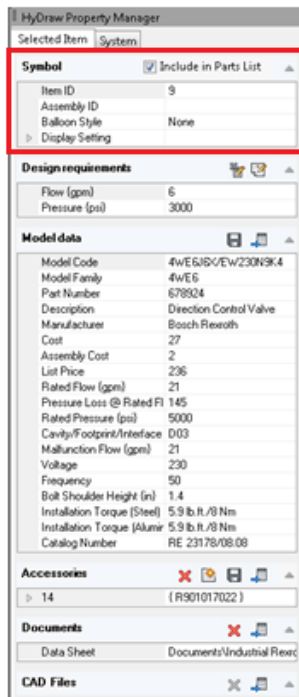
Select the symbol in the drawing.

The *Selected Item* tab page displays the following sections:

1. Symbol

The Symbol section displays the ID, balloon style, and various display settings of the symbol.


- Customize the balloon style to circle, oval, rectangle, rounded rectangle, hexagon or none of these.
- Show or Hide various display settings with the symbol on the drawing.
- Click  to expand and then select Hide or Show to hide or show the respective parameters.
- Select the checkbox on the caption bar to include the Selected Item properties in the respective component Parts List of the circuit.

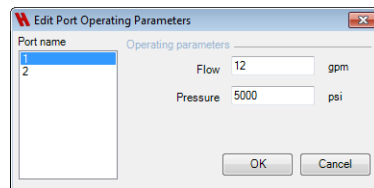


Selected Item tab page


2. Design Requirements

The Design requirements section enables you to search for the required components by specifying a design parameter and value, from the library.

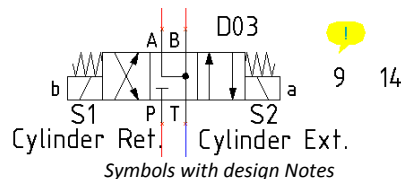
- Type the value in the text box of the respective parameter.
- Click  on the **Design Requirements** caption bar to open Edit Port Operating Parameters.
- Specify separate flow and pressure for each port of a component.



Edit Port Operating Parameters

- Click  on **Edit Design Note** to add the design notes to the component.

The *Design Note Icon* appears on the top of the *Item ID*.



3. Model Data

Displays the details of the component selected.


Select from Library

- Select model data for a component using either the

Local database installed on the system

OR

Online database of FluidPowerTools.com

Click  on the Model Data caption bar to fetch the component from the library.

The Select from Library dialog box displays with the input data.

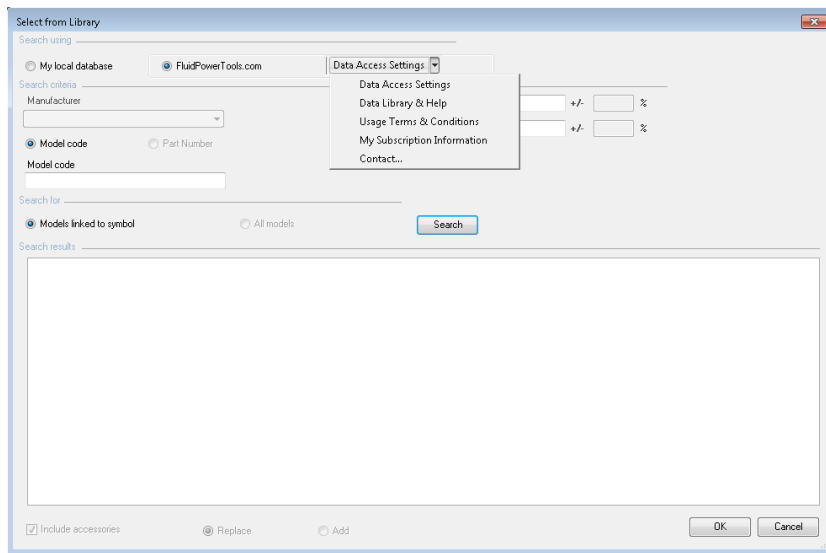
- Select the database to search, i.e.,
My local database or Fluidpowertools.com

*If the My local database option is selected,
the program searches the component in the local database of the user.*

*If the FluidPowerTools.com database option is selected,
the split button on the right is enabled,*

Data Access Settings

- In the Data Access Settings, select **manufacturer database** to search for components.



Fetch from Library - Data Access Settings

*The Data Access Settings drop down provides other controls,
which includes:*

Data Access Settings, Data library and Help topics, Usage terms and conditions, My Subscriptions information, and Contact.

- Click **Models linked to symbol** to display the component models linked to this symbol.
- Click **all models** to display all component models available to the component type of the symbol.
- Click the **Search** button to search for the component.
The search results display in the Search results pane.
- Click **OK**.

Add Accessories

You can add or replace accessories of the model code to the symbol by selecting an appropriate button.


- Select the **Include accessories** check box, and then select **Add**.
The linked accessories of the component model will be added to the selected model.

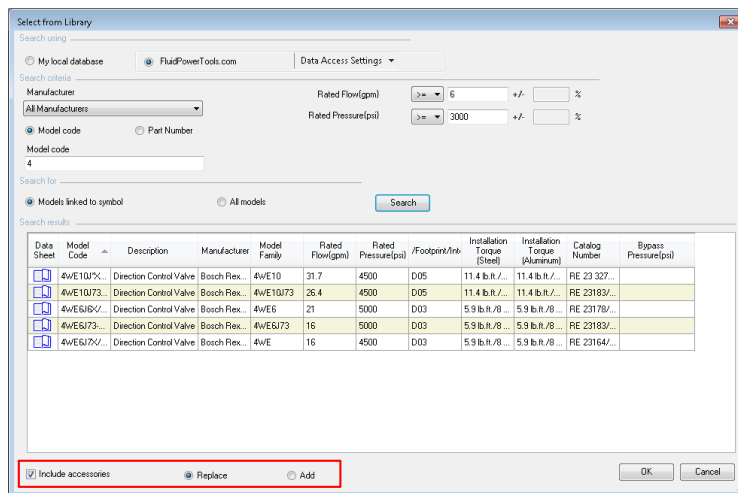
Replace Accessories

- Select the **Include accessories** check box, and then select **Replace**.
The linked accessories of the component model will be added to the selected model and all accessories linked previously will be delinked.

Saving Model Data into Library

You can save the designed component with customized data in the library.

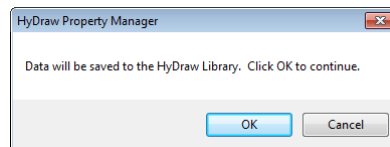
- Click  on the Model Data caption bar to save custom details in the library.



The "Select from Library" dialog box is shown. It has a search bar at the top with "FluidPowerTools.com" selected. Below the search bar are search criteria: "Manufacturer" (set to "All Manufacturers"), "Rated Flow(gpm)" (6), and "Rated Pressure(psi)" (3000). There are radio buttons for "Model code" and "Part Number", with "Model code" selected. A "Search for" field contains the number "4". Below this are radio buttons for "Models linked to symbol" and "All models", with "Models linked to symbol" selected. A "Search" button is to the right. The "Search results" section contains a table with columns: Data Sheet, Model Code, Description, Manufacturer, Model Family, Rated Flow(gpm), Rated Pressure(psi), /Footprint/inch, Installation Torque (Steel), Installation Torque (Aluminum), Catalog Number, and Bypass Pressure(psi). The table lists five Bosch Rexroth direction control valves. At the bottom, there is a red-bordered box containing the "Include accessories" checked checkbox, and radio buttons for "Replace" (selected) and "Add". "OK" and "Cancel" buttons are at the bottom right.

Data Sheet	Model Code	Description	Manufacturer	Model Family	Rated Flow(gpm)	Rated Pressure(psi)	/Footprint/inch	Installation Torque (Steel)	Installation Torque (Aluminum)	Catalog Number	Bypass Pressure(psi)
	4wE1017C	Direction Control Valve	Bosch Rex...	4wE10	31.7	4500	D05	11.4 lb.ft./...	11.4 lb.ft./...	RE 23 327 ..	
	4wE10173	Direction Control Valve	Bosch Rex...	4wE10173	25.4	4500	D05	11.4 lb.ft./...	11.4 lb.ft./...	RE 23183/...	
	4wE618V/...	Direction Control Valve	Bosch Rex...	4wE6	21	5000	D03	5.9 lb.ft./8 ...	5.9 lb.ft./8 ...	RE 23178/...	
	4wE6173...	Direction Control Valve	Bosch Rex...	4wE6173	16	5000	D03	5.9 lb.ft./8 ...	5.9 lb.ft./8 ...	RE 23183/...	
	4wE617V/...	Direction Control Valve	Bosch Rex...	4wE	16	4500	D03	5.9 lb.ft./8 ...	5.9 lb.ft./8 ...	RE 23164/...	

Fetch from Library with Search results



The "HyDraw Property Manager" dialog box is shown. It contains the text: "Data will be saved to the HyDraw Library. Click OK to continue." At the bottom are "OK" and "Cancel" buttons.


Save to Library

4. Accessories


The Accessories section displays the details of accessories assigned with the item. This section also displays all documents and CAD files linked with the accessory.

Select from Library

You can fetch required accessories to your component from the library.

1. Click  on the Accessories caption bar to open Select Accessories from Library dialog box.
2. Select **Accessories** or **Components**.
3. Select the required manufacturer and component type.
4. To refine the search, type the Model Code, and then click **Search**.

All available accessories of the selected component type display in the Available accessories pane.

5. Define more criteria,
 - For precise search, define custom search parameters.
 - Click  to view the Select Property box, which displays common properties.
 - Select the property you want to assign.
 - Click OK.
6. Click Search.

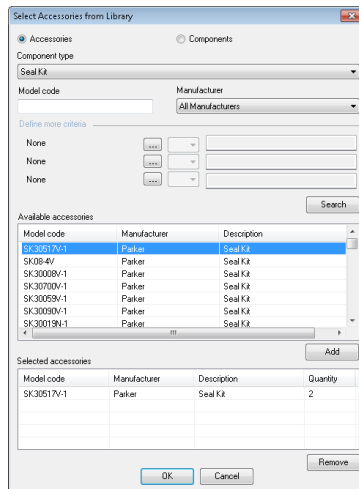
All available accessories of the selected component type display in the Available accessories pane.

7. Select the model code you want to add to your circuit.
8. Click **Add**.

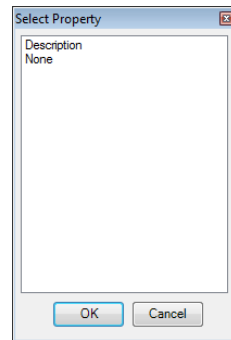
The added model codes display in the Selected accessories pane.

9. Select the model code and click **Remove** to remove the selected model code from the selected accessories pane.
10. Click **OK**.

All the selected accessories are added to the component and displayed in the Accessories pane on the Selected Item tab page.





Fetch Accessories from Library

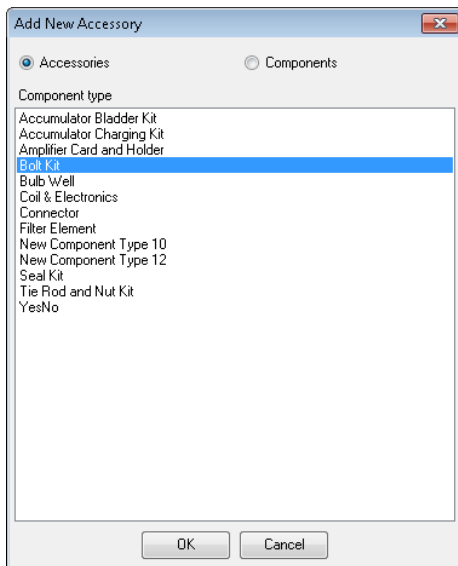


Selected accessories

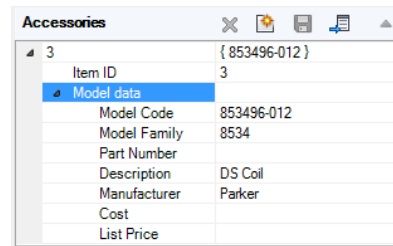
Add New Accessories

You can add new accessories to the selected item and save in the library.

1. Click  on the Accessories caption bar.
The Add New Accessory dialog box displays.
2. Select Accessories Components.
3. Select the appropriate component type you want to add.
4. Click **OK**.
The accessories are assigned to the component and displayed in the Accessories pane.
5. Click  to expand the newly added accessories menu.
6. Enter the required data in the appropriate text box.



Add New Accessory window


The 'Accessories' section of the software interface is shown. It displays a table with accessory data for Item ID 3. The table has columns for Item ID, Model Code, Model Family, Part Number, Description, Manufacturer, Cost, and List Price. The 'Model data' row is expanded, showing the following values: Model Code: 853496-012, Model Family: 8534, Part Number, Description: DS Coil, Manufacturer: Parker, Cost, and List Price.

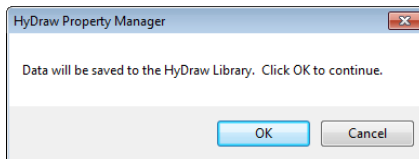
Item ID	Model Code	Model Family	Part Number	Description	Manufacturer	Cost	List Price
3	853496-012	8534		DS Coil	Parker		

Accessories section

Save Accessories


You can save the newly added accessories to the component.

1. Click  on the Accessories caption bar.
The Save to Library dialog box displays.
2. Click **OK**.
The new accessories are saved.

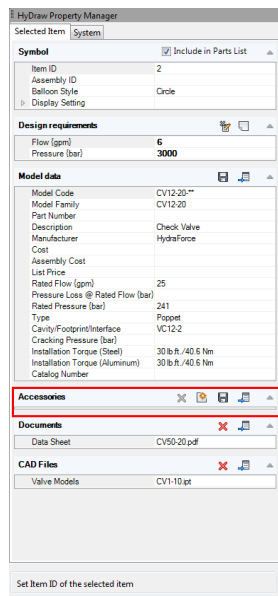


Save to HyDraw Library message box

Delete Accessories


1. Select the accessory you want to remove.
2. Click  on the **Accessories** caption bar to delete the accessory.

The accessory is deleted from the component.





HyDraw Property Manager



Selected Item: System

Symbol  Include in Parts List





Item ID: 2
Assembly ID:
Ballon Style: Circle
Display Setting:





Design requirements  

Flow [gpm]: 6
Pressure [bar]: 3000





Model data  

Model Code: CV12-20-
Model Family: CV12-20
Part Number:
Description: Check Valve
Manufacturer: HydraForce
Cost:
Assembly Cost:
List Price:
Rated Flow [gpm]: 25
Pressure Loss @ Rated Flow [bar]:
Rated Pressure [bar]: 241
Type: Poppet
Cavity/Footprint/Interface: VC12-2
Cracking Pressure [bar]:
Installation Torque (Steel): 30 lb.ft./40.6 Nm
Installation Torque (Aluminum): 30 lb.ft./40.6 Nm
Catalog Number:

Accessories    

Documents    

Data Sheet: CV50-20.pdf

CAD Files    


Valve Models: CV1-10.pt


Set Item ID of the selected item

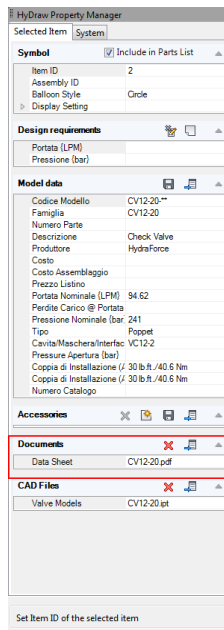
Accessories deleted from library

5. Documents

Documents section displays the documents linked with the selected component model. You can delete and link documents from library.


Click  on the **Documents** caption bar to delete the linked document.

Click  **Select from library** to link new document to the selected component model.





HyDraw Property Manager



Selected Item: System

Symbol  Include in Parts List





Item ID: 2
Assembly ID:
Ballon Style: Circle
Display Setting:





Design requirements  

Portata (LPM):
Pressione [bar]:





Model data  

Codice Modello: CV12-20-
Famiglia: CV12-20
Numero Parte:
Descrizione: Check Valve
Produzione: HydraForce
Costo:
Costo Assemblaggio:
Prezzo Listino: 94.62
Portata Nominale (LPM): 241
Perdite Carico @ Portata:
Pressione Nominale [bar]: 241
Tipo: Poppet
Cavita/Maschera/Interf: VC12-2
Pressure Apertura [bar]:
Coppia di Installazione (/): 30 lb.ft./40.6 Nm
Coppia di Installazione (/): 30 lb.ft./40.6 Nm
Numero Catalogo:

Accessories    

Documents    

Data Sheet: CV12-20.pdf

CAD Files    



Valve Models: CV12-20.pt

Set Item ID of the selected item

Documents Section

6. CAD Files

The CAD Files section displays the CAD files linked with the selected component model. You can delete and link CAD files from the library.

- Click  on the **CAD Files** caption bar to delete the linked CAD files.
- Click  **Select from library** to link new CAD files to the selected component model.

HyDraw Property Manager

Selected Item **System**

Symbol ☒ Include in Parts List

Item ID	2
Assembly ID	
Balloon Style	Circle
Display Setting	

Design requirements

Portata (LPM)	
Pressione (bar)	

Model data

Codice Modello	CV12-20-*
Famiglia	CV12-20
Numero Parte	
Descrizione	Check Valve
Produttore	HydraForce
Costo	
Costo Assemblaggio	
Prezzo Listino	
Portata Nominale (LPM)	94.62
Perdite Carico @ Portata	
Pressione Nominale (bar)	241
Tipo	Poppet
Cavita'/Maschera/Interfac.	VC12-2
Pressure Apertura (bar)	
Coppia di Installazione (x 30 lb.ft./40.6 Nm)	
Coppia di Installazione (x 30 lb.ft./40.6 Nm)	
Numero Catalogo	

Accessories

Documents

Data Sheet	CV12-20.pdf
------------	-------------

CAD Files

Valve Models	CV12-20.pt
--------------	------------

Set Item ID of the selected item

CAD File Section

24. System Properties

When you open a schematic in the HyDraw® CAD, the System tab page displays the assigned properties of the selected system in the drawing. Add new accessories to the system and save in the library.

1. Components

The Components section displays the model codes of all the components in the circuit.

Select the Item ID to highlight the corresponding component in the drawing.

2. External Ports

The External Ports section displays the ID and the size of all external ports in the circuit.

Select the Item ID to highlight the corresponding external port in the drawing.

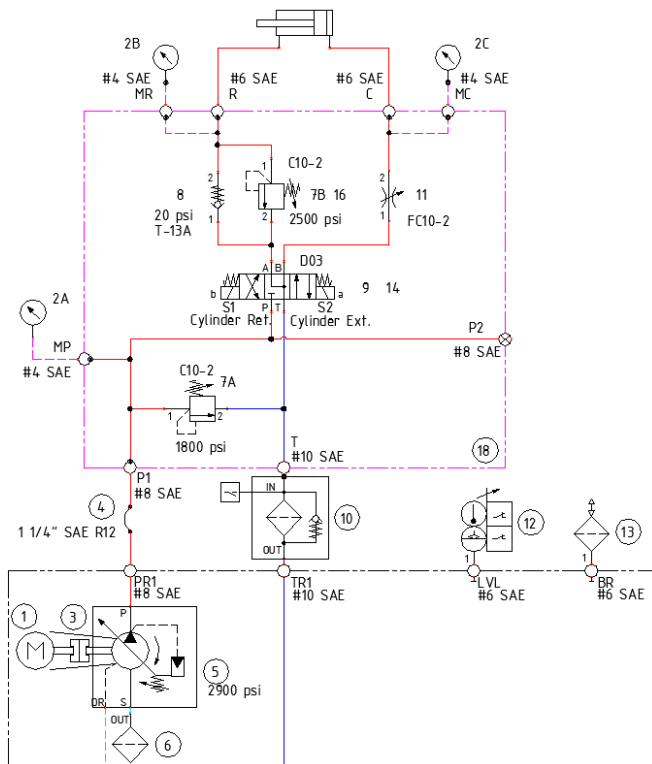
3. Envelopes

The Envelopes section displays the ID and the description of all envelopes in the circuit.

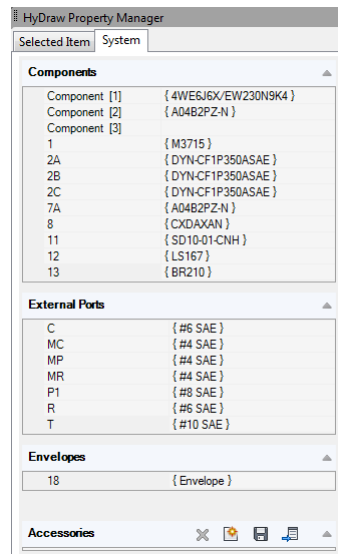
Select the Item ID to highlight the corresponding envelope in the drawing.

4. Accessories

The Accessories section displays the details of accessories assigned with the circuit.



Schematic




System tab page

25.Edit Properties

Edit various properties of a symbol, external port, envelope line, and connection line.

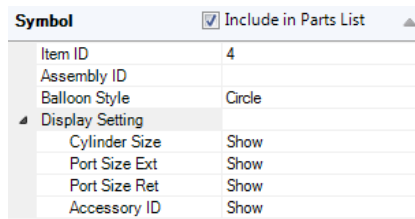
It displays the HyDraw® Property Manager, where the properties can be added and modified.



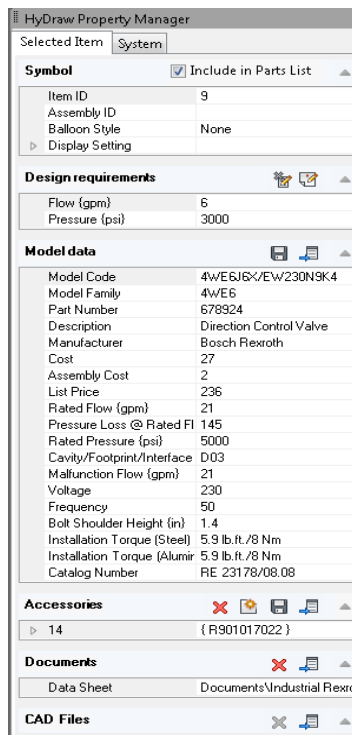
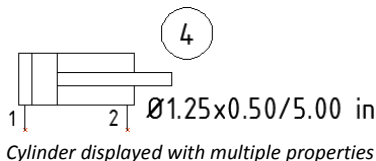
1. Click Circuit > **Edit**  on the HyDraw CAD ribbon menu.

The HyDraw Property Manager window displays.

2. Edit the required properties of a symbol.
3. The Display Setting can display multiple properties, if already defined in the Library Manager.




HyDraw Property Manager - Display Settings



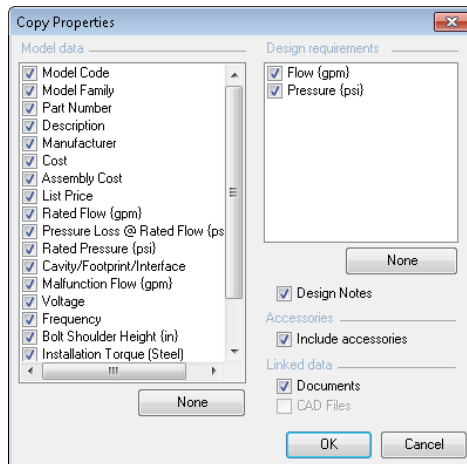
HyDraw Property Manager

26.Copy Properties

*Copy component data, design requirements, accessories and linked data properties from one component symbol to another component symbol of the same category.
Also, copy the properties of external ports and envelope data.*

1. Click  on the HyDraw® CAD ribbon menu.
The Select Source Symbol prompt displays.
2. Select the source symbol.
The Select Destination Symbols prompt displays.
3. Select a single or multiple destination symbols.
4. After completion of selection, press the **Enter** key.
The Copy Property dialog box displays.
5. Select the required design requirements, if you want to copy from the **Design requirements** checklist box.
6. Select the **Include accessories** checkbox, if you want to copy the accessories to the destination symbol.
7. Select the Include **Linked Documents** and **Linked CAD Files** checkbox, if you want to copy the linked Documents and CAD Files to the destination symbol.
8. Click **Ok**.


The properties are copied to the destination symbol(s).

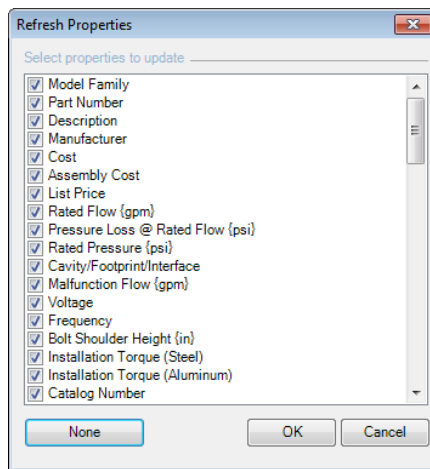


Copy Properties

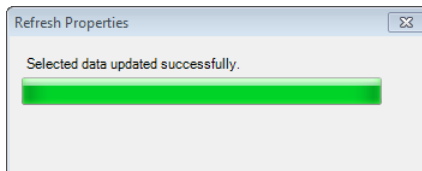
27.Refresh Properties

Update the property values of symbols or a system from HyDraw® Library.

1. Click Circuit >  on the HyDraw CAD ribbon menu.
The Select symbols prompt displays.
2. Select a single or multiple symbols.
3. After completion of selection, press the **Enter** key.
The Specify Items Included [Components/ Accessories/ Include All/ More Options] <Include All> prompt displays.
4. Specify the items to be refreshed.
The Refresh Properties dialog box displays.
5. Select individual properties to Refresh or **Select All**.
6. Click **OK**.
The Update message box displays.




Refresh properties



Successful Update message

28.Update Property List

Update the properties of the components, external ports, connection lines and accessories from the HyDraw® Library.

1. Click Circuit >  on the HyDraw CAD ribbon menu.
The Select symbols and connections prompt displays.
2. Select a single or multiple symbols, external ports, connection lines.
After completion of selection, press the **Enter** key.

The Specify Items Included [Components/ Accessories/ Include All/ More Options] <Include All> prompt displays.

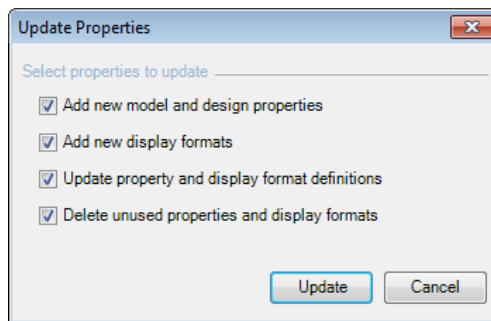
More Options further Prompts,

Include Components [Yes No] <Yes>.

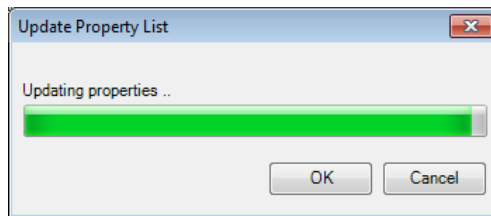
Include Component Accessories [Yes No] <Yes>.

Include System Accessories [Yes No] <Yes>.

3. Select the required option.
The Update Properties List dialog box displays.
4. Select the items to be included,
 - Add new model and design properties
 - Add new display formats
 - Update property and display format definitions
 - Delete unused properties and display formats
5. Click **Update**.
The Update Property List message box displays the status.
6. Click **OK** to apply and exit.




Update Properties List

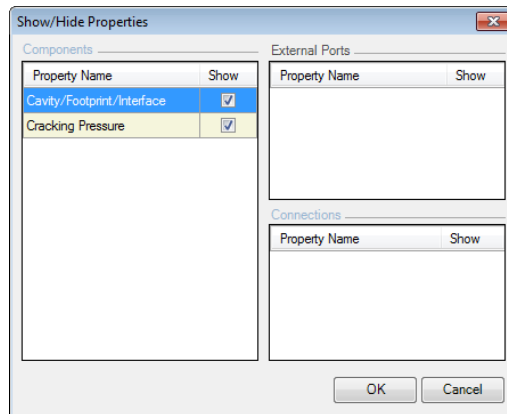


Update Status

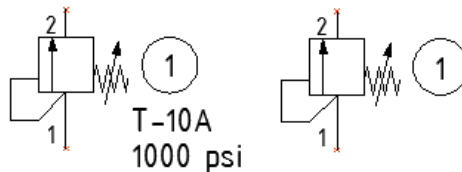
29.Show/Hide Properties

The properties toggle between display or hide in the drawing.

1. Click System > Properties  on the HyDraw® CAD ribbon menu.
The Select symbols and connections prompt displays.
2. Select a single or multiple symbols, external ports, connection lines after completion of selection, press the **Enter** key.
The Show/Hide Properties dialog box displays.
3. Select the properties in the Components, External Ports section and Connections section.
4. Click **OK** to apply and exit.



Show/Hide Property dialog box

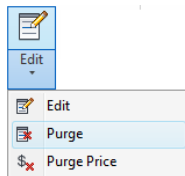


Hiding a Property

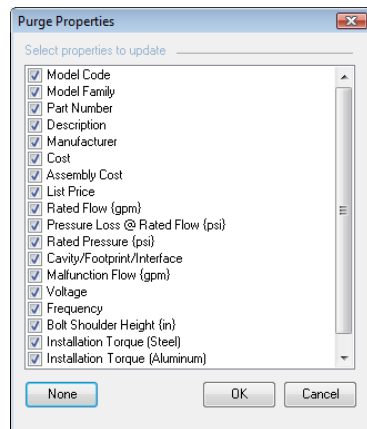
30. Purge Properties

Clear the properties of a symbol.

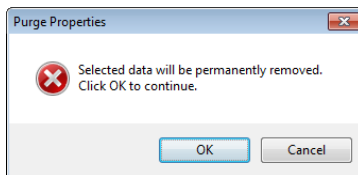
1. Click Circuit > Edit > **Purge** on the HyDraw® CAD ribbon menu.
The Select Symbols prompt displays.
2. Select a single or multiple symbols.
After the completion of selection, press the **Enter** key.
The Specify items included [Components/Accessories/Include all/More options] <Include All> prompt displays.
3. Specify the item, properties that are to be purged and press the **Enter** key.
 - a. Select Components/Accessories/Include All:
The Purge Properties dialog box displays.
 - Select the properties to be purged.
 - Click OK.
 - b. Select More Options:
The Include components [Yes/No]: prompt displays.
 - Select Yes or No and press the Enter key.*The Include component accessories [Yes/No]: prompt displays.*
 - Select Yes or No and press the Enter key.*The Include system accessories [Yes/No]: prompt displays.*
 - Select Yes or No and press the Enter key.*The Purge Properties dialog box displays.*
 - c. Select the properties to be purged.
 - d. Click OK.
A warning message box displays.



Purge Property Sub menu



Purge Properties dialog box



Warning message box

4. Click **OK** to continue or
Click **Cancel** to exit.

The selected properties are purged.

HyDraw Property Manager

Selected Item System

Symbol ☒ Include in Parts List

Item ID	1
Assembly ID	
Balloon Style	None
Display Setting	

Design requirements

Flow (gpm)	6
Pressure (psi)	4800

Model data

ModelCode	SD10-01-CNH
BaseModel	SD10-01
Description	Needle Valve
Manufacturer	Hydac
PartNumber	5461
Cost	
AssemblyCost	
ListPrice	
RatedFlow	42
PressureLossAtRatedFl	
RatedPressure	6000
ItemType	Poppet
CavityName	FC10-2
InstallationTorqueAlumi	29.5-37 lb.ft./40-50 Nm
InstallationTorqueSteel	29.5-37 lb.ft./40-50 Nm
CatalogNumber	

Accessories

2	{ SK325 }
---	-----------

Documents

Data Sheet	SD10-01.pdf
------------	-------------

CAD Files

Valve Models	CBB LHN.ipt
--------------	-------------

HyDraw Property Manager before purge property

HyDraw Property Manager

Selected Item System

Symbol ☒ Include in Parts List

Item ID	1
Assembly ID	
Balloon Style	None
Display Setting	

Design requirements

Flow (gpm)	6
Pressure (psi)	4800

Model data

ModelCode	
BaseModel	
Description	
Manufacturer	
PartNumber	
Cost	
AssemblyCost	
ListPrice	
RatedFlow	
PressureLossAtRatedFl	
RatedPressure	
ItemType	
CavityName	
InstallationTorqueAlumi	
InstallationTorqueSteel	
CatalogNumber	

Accessories

2	
---	--

Documents

Data Sheet	SD10-01.pdf
------------	-------------

CAD Files

Valve Models	CBB LHN.ipt
--------------	-------------

HyDraw Property Manager after purge property

31.Purge Price Data

1. Click Circuit > Edit > **Purge Price Data** on the HyDraw® CAD ribbon menu.

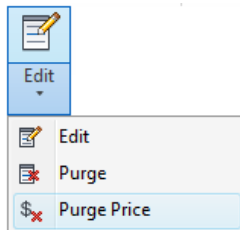
The components in the schematic are selected automatically.

The Purge Price Data warning message box displays, indicating that the price data will be removed permanently from all the components in the drawing.

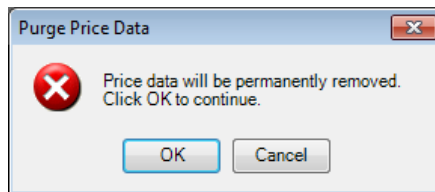
2. Click **OK**, if you want to continue.

On completion, prompts a message - Price data removed successfully.

3. Click **OK**.



Purge Price sub menu




Purge Price Data warning box

Note:

Save the schematic with a different file name and/or location before removing price information for your convenience and future reference.

32.ERP Interface

Fetch the data from the ERP data file in the Excel format.

1. Click Circuit >  on the HyDraw® CAD ribbon menu.
HyDraw prompts for the selection.
2. Select Components, Component accessories, and System accessories, as required.

*The **Fetch Data from ERP** dialog box displays.*

The columns get populated with the matching Model codes values.

*Partially matching Model Codes are displayed with the **Select** link.*

3. Click the **Select** link.

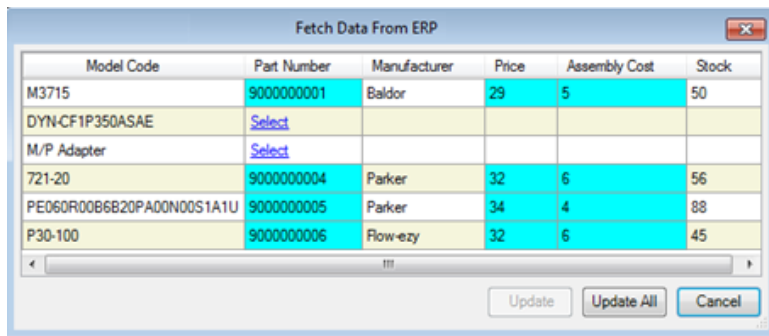
*The **Select Model** dialog box displays.*

Select the available Model Code, as required.

Click **OK**.

The highlighted cells indicate the matching values with the selected components and accessories.

4. Click **Update** to update the selected row.
5. Click **Update All** to update all the rows in the drawing.
6. Click **Cancel** to exit.

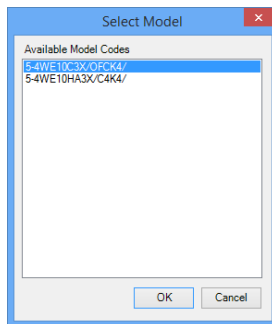


The dialog box titled "Fetch Data From ERP" contains a table with 6 columns: Model Code, Part Number, Manufacturer, Price, Assembly Cost, and Stock. The table lists several items, with some cells highlighted in yellow and others in cyan. The "Part Number" column contains links labeled "Select" for items that are partially matching.

Model Code	Part Number	Manufacturer	Price	Assembly Cost	Stock
M3715	9000000001	Baldor	29	5	50
DYN-CF1P350ASAE	Select				
M/P Adapter	Select				
721-20	9000000004	Parker	32	6	56
PE06R00B6B20PA00N00S1A1U	9000000005	Parker	34	4	88
P30-100	9000000006	Flow-ezy	32	6	45

At the bottom of the dialog box are three buttons: "Update", "Update All", and "Cancel".

Fetch Data From ERP



Select Model dialog box

Modify Symbols

HyDraw CAD800 CAD800 Drawing.dwg

Symbol Port Terminator Stretch Match Move Rotate Left Rotate Right Flip Horizontal Flip Vertical Delete Symbol Symbol Port Stack Edit Refresh Update Solenoid Info ERP Options

CAD800 Drawing* x

ITEM ID	QTY	MODEL CODE	DESCRIPTION
1	1	M3715	Electric Motor
2	3	DYN-CF#P30ASAE	Pressure Gage, 0-5
3	1	D25M/SAEB	Motor/Pump Adapter
4	1	Z21-20	Hose
5	1	PE060R00B6B20PA00N00S1AU	Pump Variable Single
6	1	P30-100	Suction Strainer
7	2	A04B2PZ-N	Direct Acting Press
8	1	CX0AXAN	Check Valve
9	1	4WESJ6X/EW730N9K4	Direction Control Va
10	1	50AS1050EBP0G20	Filter
11	1	SD10-01-0NH	Needle Valve
12	1	LS167	Float & Temperature
13	1	BR210	Filler/Breather
14	1	R901017022	Black Mating Conne

ITEM ID	PORT TYPE	DESCRIPTION
BR, C, LVL, R	SAE 0-ring	#6 SAE
MC, MP, MR	SAE 0-ring	#6 SAE
P1, P2, PR1	SAE 0-ring	#8 SAE
T, TR1	SAE 0-ring	#10 SAE

NET NAME	NET LIST
NET-1	MC, C, 11-2
NET-2	T, 7A-2, 9-T
NET-3	MP, P2, P1, 7A-1, 9-P
NET-4	MR, R, 7B-1, 8-2
NET-6	11-1, 9-B
NET-7	7B-2, 8-1, 9-A

FUNCTION	DESCRIPTION
Cylinder	Cylinder
Cylinder	Cylinder

VEST
Cylinder Control

12.2140, 11.1119, 0.0000

Model Layout1


12.2140, 11.1119, 0.0000

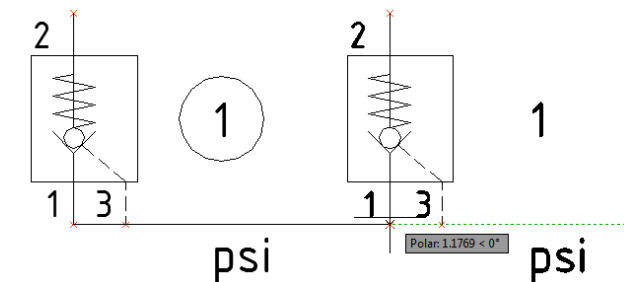
Model 1:1

- 33 Move Symbol
- 34 Align Symbols
- 35 Rotate Symbols
- 36 Flip Symbols
- 37 Align Symbol Ports
- 38 Align External Port Names
- 39 Edit Symbol Port
- 40 Edit in Place
- 41 Delete a Symbol
- 42 Stack Symbols
- 43 Show/Hide Port Names
- 44 Edit Solenoid Information

33.Move Symbol

Move a symbol from one point to another in the drawing.

1. Click Circuit > **Move**  on the HyDraw® CAD ribbon menu.
The Select Symbol to Move prompt displays.
2. Select the symbol.
The Specify Base point or [Displacement] <Displacement> prompt displays.
3. Specify the base point of the symbol.
The Specify second point prompt displays.
4. Specify the second point.
The symbol is moved to the new location.



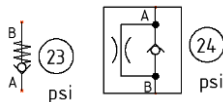
Move Symbol

34.Align Symbols

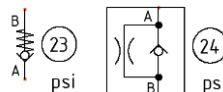
Align multiple symbols with another symbol, horizontally or vertically, from left, right, or middle.

1. Click Circuit > **Align Symbols**  on the HyDraw® CAD ribbon menu.

The Select Symbols to Move prompt displays.



Symbols aligned from bottom



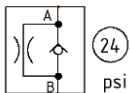
Symbols aligned from top

2. Select a single symbol or multiple symbols.
After completion of selection, press the **Enter** key.

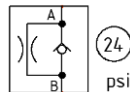
The Select Symbol to Align With prompt displays.

3. Select the symbol.

The Align [Tops/Middles/ Bottoms/ Lefts/ Centers/ Rights] prompt displays.



Symbols aligned from right



Symbols aligned from left

4. Select the required alignment and press the **Enter** key.

The symbols get aligned with the selected symbol accordingly.

35.Rotate Symbols

Rotate a symbol, 90 degrees to its left or right.

The associated text is constrained to remain horizontal.

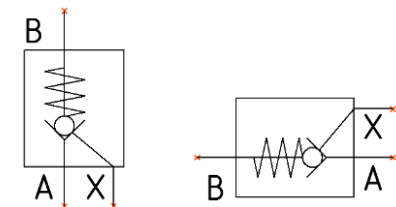
1. Rotate Left

1. Click Circuit > **Rotate Left**  on the HyDraw® CAD ribbon menu.

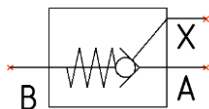
The Select Symbols prompt displays.

2. Select a single or multiple symbols.
After completion of selection, press the **Enter** key.

The symbol rotates 90 degrees to its left.



Select a symbol



Rotate symbol to the left

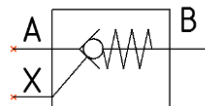
2. Rotate Right

1. Click Circuit > **Rotate Right**  on the HyDraw CAD ribbon menu.

The Select Symbols prompt displays.

2. Select a single or multiple symbols.
After completion of selection, press the **Enter** key.

The symbol rotates 90 degrees to its right.




Rotate symbol to the right

36.Flip Symbols

Flip a symbol horizontally or vertically. The associated text is constrained to remain horizontal.

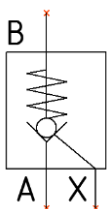
1. Flip Horizontal

1. Click Circuit >  **Flip Horizontal** from the Modify Symbol option on the HyDraw® CAD ribbon menu.

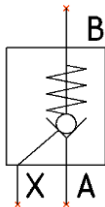
The Select Symbols command displays.

2. Select a single or multiple symbols.
After completion of selection, press the **Enter** key.

The symbol flips horizontally.




Symbol inserted in the drawing



Symbol after horizontal flip

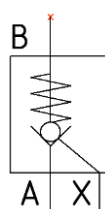
2. Flip Vertical

1. Click Circuit >  **Flip Vertical** from the Modify Symbol option on the HyDraw CAD ribbon menu.

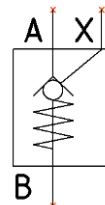
The Select Symbols command displays.

2. Select a single or multiple symbols.
After completion of selection, press the **Enter** key.

The symbol flips vertically.




Symbol inserted in the drawing



Symbol after vertical flip

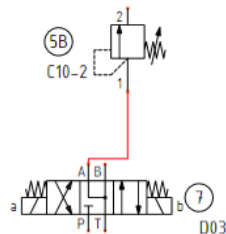
37.Align Symbol Ports

Align ports of different symbols horizontally or vertically.

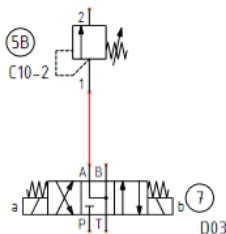
1. Click Circuit > **Align Symbol Ports**  on the HyDraw® CAD ribbon menu.
The Select Symbols Port to Move prompt displays.
2. Select a port by clicking on the red cross or the port name.
The Select Symbol Port to Align With prompt displays.
3. Select a port by clicking on the red cross or the port name.
The Align on [X-axis/ Y-axis] command displays on the command window.
4. Enter the appropriate axis and press the **Enter** key.
The symbols are aligned with reference to their ports.

Note:

When aligning external ports (that are aligned with the envelope) to symbol ports, in some cases the envelope line may pass through the external ports. In such cases, manually adjust the envelope line.

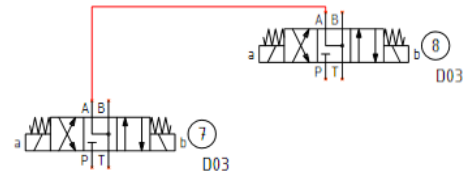


Before

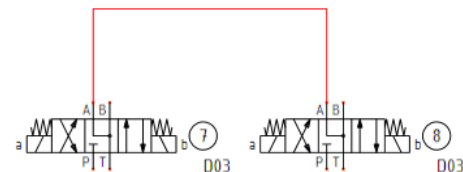


After

Symbol ports aligned vertically



Before




After

Symbol ports aligned horizontally

38.Align External Port Names

Align port names of all the selected ports horizontally or vertically along the envelope line.

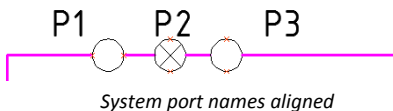
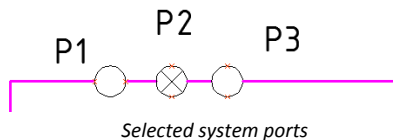
1. Click Circuit > **Align External Port Names**  on the HyDraw® CAD ribbon menu.

The Select System Ports prompt displays.

2. Select ports to align port names.
After completion of selection, press the **Enter** key.



The symbol-port names get aligned.

In this selection, the left and bottom port name is taken as reference and all other system port names are aligned in a single line parallel to the envelope.



39.Edit Symbol Port

Edit the port name of the selected symbol in the drawing.
It does not affect the master symbol in the HyDraw® library.

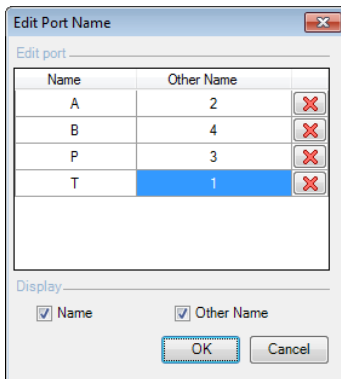
1. Click Circuit > **Edit Symbol Port**  on the HyDraw CAD ribbon menu.
The Select Symbol prompt displays.
2. Select the symbol port to be renamed.
The Edit Port dialog box displays.
3. Type the new name in the **Name** column and the optional **Other Name** column.
4. To delete the port, click .
5. Select **Name/Other Name** in the Display option.
6. Click **OK**.

The name or the other name of the port displays with the symbol.

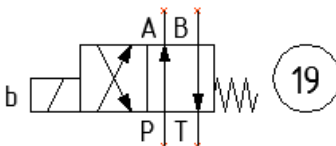
If both the names are selected, then dual port names are displayed.

Note:

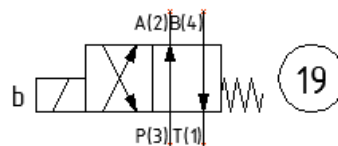
The changes affect only the symbol in the drawing and not the master symbol in the HyDraw Library.



Edit Port Name



Symbol with unedited ports




Symbol with Dual port names

40.Edit in Place

Edit the selected symbol in the drawing.

It does not affect the master symbol in the HyDraw® library.

1. Click **Circuit > Edit symbol**

 on the HyDraw CAD ribbon menu.

The Select Symbol to Edit prompt displays.

2. Select the symbol from the drawing you want to edit.

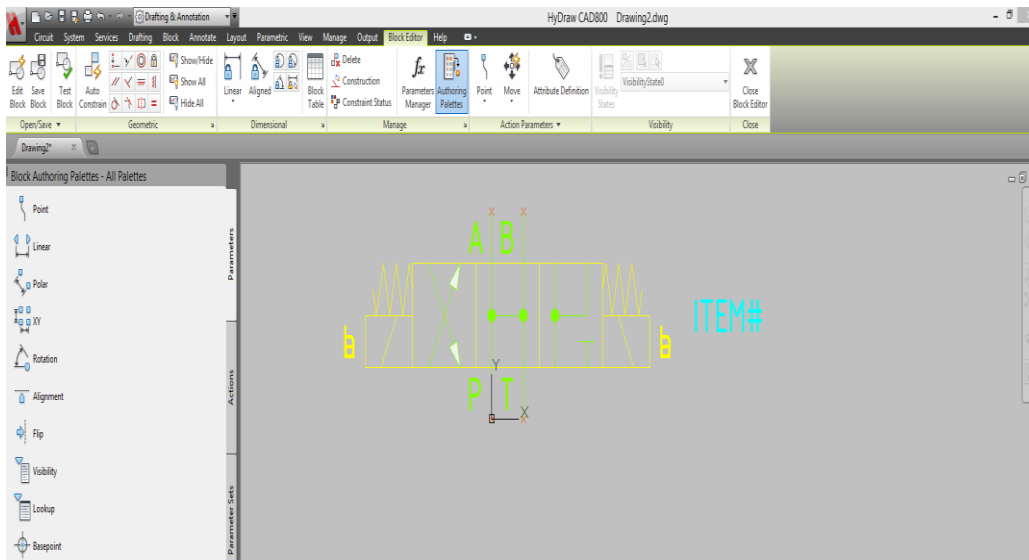
The symbol opens in the Block Editor.

This can be edited using the block Authoring palettes.

3. Click **Close Block Editor** to close the window after you make the changes.

Note:


The changes affect only the symbol in the drawing and not the master symbol in the HyDraw Library.



Symbol opens in Block Editor window

41.Delete a Symbol

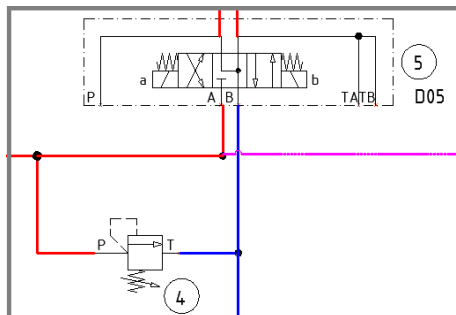
Delete a symbol from the drawing.

1. Click Circuit> **Delete**  on the HyDraw® CAD ribbon menu.

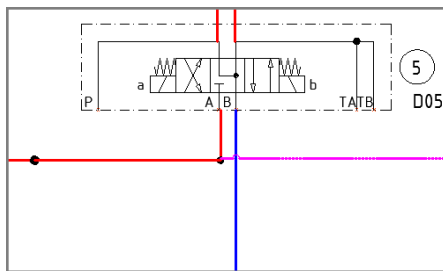
The Select Symbols prompt displays.

2. Select a single symbol or multiple symbols to delete. After completion of selection, press the **Enter** key.

The selected symbols and the connections are deleted.




Circuit Before Deleting a Symbol



Circuit After Deleting a Symbol

42.Stack Symbols

Stack symbols horizontally or vertically.

1. Click Circuit > **Stack**  on the HyDraw® CAD ribbon menu.
The Select Symbols to Stack prompt displays.

2. Select multiple symbols to stack.
After completion of selection, press the **Enter** key.

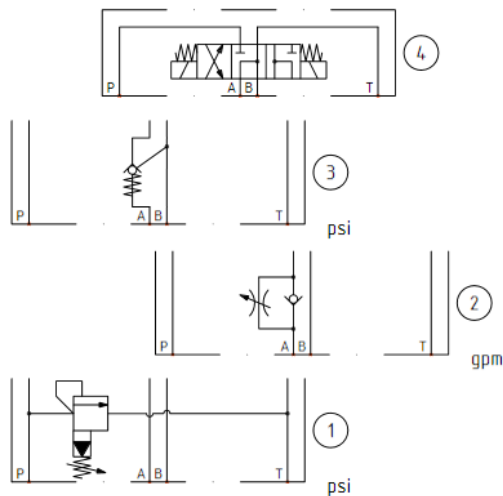
*The Stack direction
[Up/Down/Right/Left] <Up>:
prompt displays.*

3. Select the direction.

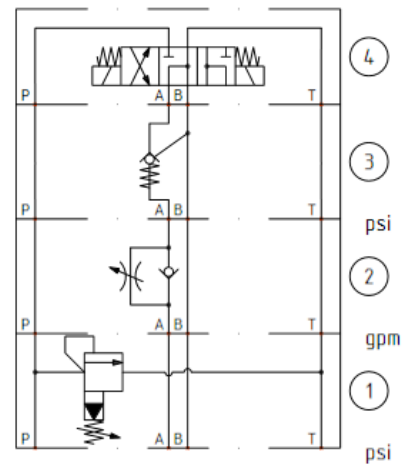
*The symbols are stacked,
accordingly.*

Note:

- Port 'P' is the default alignment guide.
- If there is no 'P' port, then port 'X' is used (e.g. Slip-in cover).
In all other cases, Symbol Alignment box center is used to align the symbols.




Symbols to Stack



Symbols after Stacking

43.Show/Hide Port Names

Toggle between ON/OFF names of the ports in the drawing.

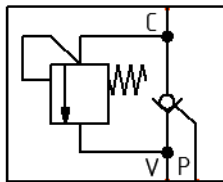
1. Click System > **Port Name**  on the HyDraw® CAD ribbon menu.
The Select Symbols prompt displays.

2. Select a single symbol or multiple symbols.
After completion of selection, press the **Enter** key.

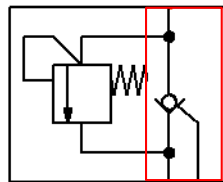
*Enter Option [Show/Hide] <Hide>:
prompt displays.*

3. Enter the required option.
 - Show: The names of the ports in the symbols are shown.
 - Hide: The names of the ports in the symbols are hidden.

*Toggle between ON/OFF names of
the ports in the drawing.*



Symbol before



Symbol after hiding port name

44.Show/Hide Design Notes

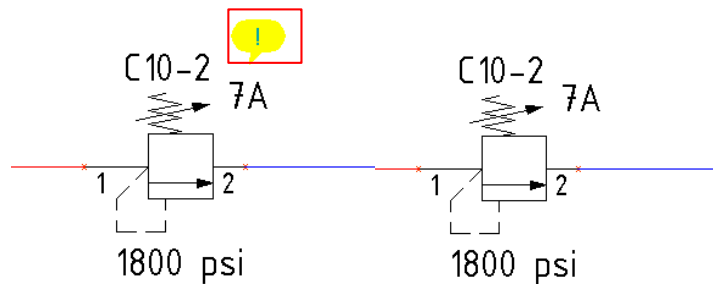
Toggle between ON/OFF design notes icon in the drawing.

1. Click System > **Design Notes**  on the HyDraw® CAD ribbon menu.

All the Design notes icons of the drawing will be hidden or shown as per its original status.

Note:

*You can edit Design notes by double clicking the icon.




Symbol showing the Design Notes icon

Symbol with the hidden Design Notes icon




45.Edit Design Notes

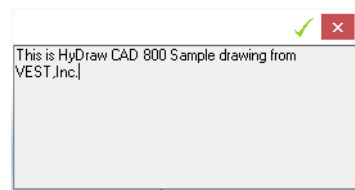
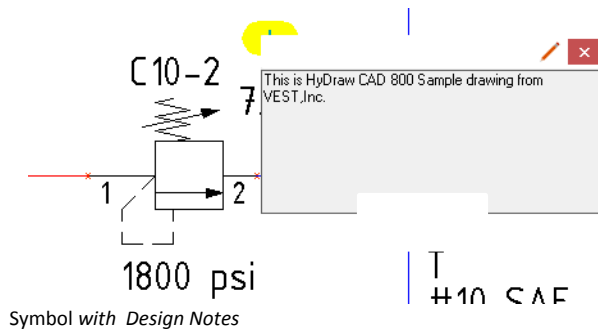
Edit the design notes of the symbol in the drawing. The changes do not affect the master symbol in the HyDraw® library

1. Double click  the Design notes icon of the symbol in the drawing.

The edit design note text box displays.

By default the design notes icon will be in the Read only mode.


2. Click the edit button  to open in the writable mode.
3. Edit the text and click  to save.
4. Click  button to close.



Edit Design Note

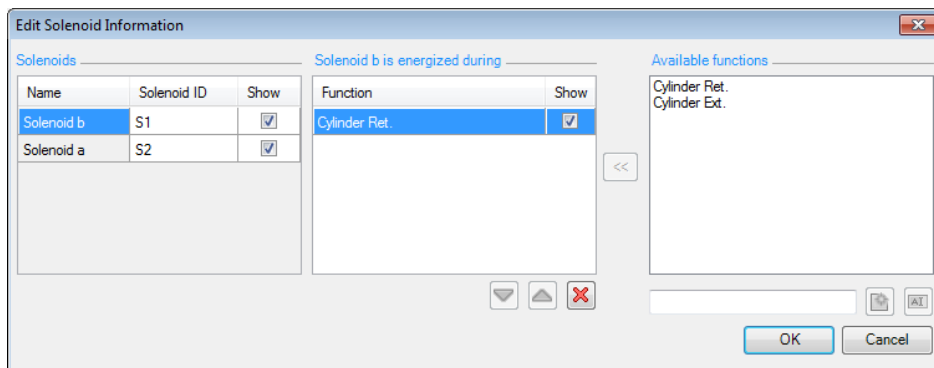
46.Edit Solenoid Information

Edit the Solenoid ID of the selected symbol and function in the drawing. It does not affect the master symbol in the HyDraw® library.

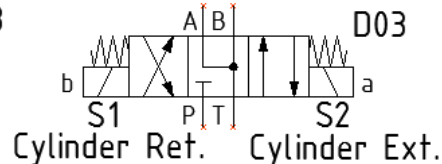
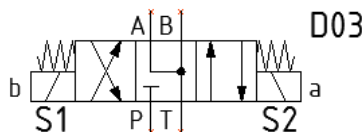
1. Select a valid HyDraw directional control valve symbol with the solenoid name.
2. Click Circuit > **Solenoid Info**  on the HyDraw CAD ribbon menu.
The Edit Solenoid Information dialog box displays.
3. In the Solenoid ID column, edit the **ID**, if already available, or enter a new ID.
The Show check box changes the visibility of the ID and function for the selected symbol.
4. In the Available functions section, enter the **Function** name and click the **Add** button.
The Update button allows editing the existing function.
 - Select the solenoid name.
 - Select the function.
 - Click the Add selected function button.
 - The selected function is added to the selected solenoid name.
5. Click **OK** to close the window and to enable changes to take effect.

Note:

Changes affect only the symbol in the drawing and not the master symbol in the HyDraw Library.



Opened symbol stencil for edit



Annotations

HyDraw CAD800 CAD800 Drawing.dwg

Circuit System Services Drafting Block Annotate Layout Parametric View Manage Output Help

Height Rotate Property Display Format Port Names Design Notes Balloon Item Hose Parts Ports Hose Actuation Net Note Docs CAD Files MDTools Unit Converter

Property Text Show/Hide ID Lists Collate Export Calculator

CAD800 Drawing* x

ITEM ID QTY MODEL CODE DESCRIPTION

1	1	M3F15	Electric Motor
2	3	DYN-CFHP350A SAE	Pressure Gage, 0-5000 PSI
3	1	J27RM/SAEB	Motor/Pump Adapter
4	1	P21-20	Hose
5	1	PE060R00B6B20PA00N00S1AU	Pump Variable Single
6	1	P30-100	Suction Strainer
7	2	A04B2PZ-N	Direct Acting Pressure Relief Valve
8	1	CXDAXAN	Check Valve
9	1	4WE6J6X/EW230N9K4	Direction Control Valve
10	1	50AS1050EBPGG20	Filter
11	1	SD01-01-CNH	Needle Valve
12	1	LS167	Float & Temperature Switch
13	1	BR210	Filter/Breather
14	1	R901017022	Black Mating Connector

ITEM ID PORT TYPE DESCRIPTION PORT SIZE

BR, C, LVL, R	SAE 0-rmg	#6 SAE	#6 SAE
MC, MP, MR	SAE 0-rmg	#4 SAE	#4 SAE
PR1, P2, PR1	SAE 0-rmg	#8 SAE	#8 SAE
T, TR1	SAE 0-rmg	#10 SAE	#10 SAE

NET NAME NET LIST FUNCTION 9-S1 9-S2

NET-1	MC, C, 11-2	Cylinder Ext.	○	○
NET-2	T, PA-2, 9-T	Cylinder Ret.	○	○
NET-3	MP, P2, P1, PA-1, 9-P			
NET-4	MR, R, PB-1, 8-2			
NET-5	11-1, 9-B			
NET-7	PB-2, 8-1, 9-A			

VEST
Cylinder Control
1 of 1

91405, 9.5396, 0.0000

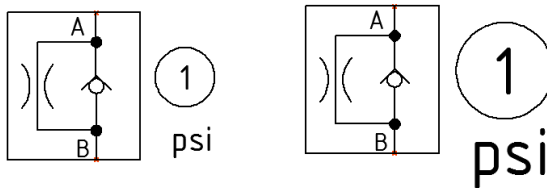
MODEL 1:1

- 47 Change Text Height
- 48 Rotate Property Text
- 49 Reassign Item ID
- 50 Reassign Hose ID
- 51 Recreate Balloons
- 52 Add New Display Format

47.Change Text Height

Change the text height of the displayed Item ID and other parameters of the selected symbols.




1. Click System > **Height** A^{\dagger} on the HyDraw[®] CAD ribbon menu.
The Select Symbols and connections prompt displays on the command window.
2. Select a single symbol or multiple symbols, and connections.
After completion of selection, press the **Enter** key.
The Specify items to update [Item ID/ Property Text/ All] <All> prompt displays.
3. Enter the items to be updated and press the **Enter** key.
4. Select Item ID/ Property Text/All:
The Change text height to <value>: prompt displays.
5. Enter the text height value and press the **Enter** key.
The height of the text is changed.

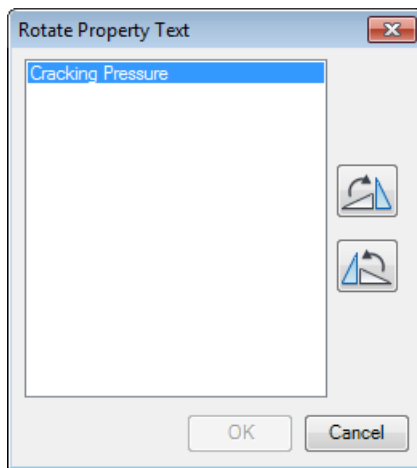


Text height changed (Before and After)

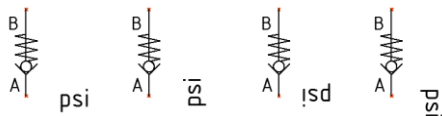
48. Rotate Property Text

Rotate the displayed text of the selected symbols and connections.

1. Click System > **Rotate**  on the HyDraw® CAD ribbon menu.
The Select Symbols and Connections prompt displays.
2. Select a single symbol or multiple symbols and connections.
After completion of selection, press the **Enter** key.
The Rotate Property Text dialog box displays.
3. Select the property you want to rotate.
4. Click **Rotate Left** 
The Property Text rotates 90 degrees to its left.
5. Click **Rotate Right** 
The Property Text rotates 90 degrees to its right.
6. Click **OK**.
The property of the text is rotated.




Rotate Property Text dialog box



Property text rotated

49.Reassign Item ID

Reassign the Item IDs of all symbols in the circuit after modification.

1. Click System >  on the HyDraw® CAD ribbon menu.

The Select Symbols prompt displays.

2. Select a single symbol or multiple symbols.
After completion of selection, press the **Enter** key.

The Reassign Item ID dialog box displays.

3. Enter the starting value of the item ID.

4. Enter the assembly ID.

5. Choose the Balloon shape.

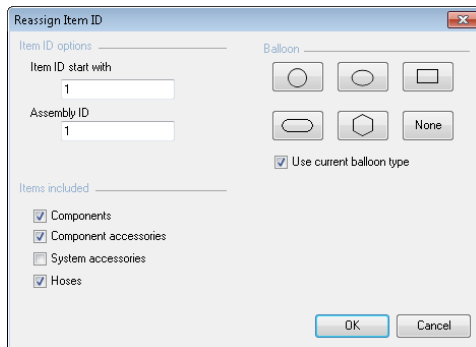
Select the checkbox, if you want to use the current balloon type.

6. Select the appropriate option for Items included.

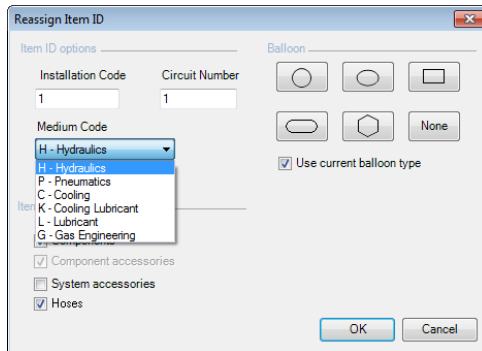
- Select the Components checkbox to include all components.
- Select the Component accessories checkbox to include all component accessories.
- Select the System accessories checkbox to include all system accessories.
- De-select the Hoses checkbox to exclude hoses.

7. Click OK.

8. For ISO 1219 Scheme, enter the **Installation Code**, **Circuit Number** and **Medium Code**.




Reassign Item ID



Reassign Item ID – ISO 1219 Scheme

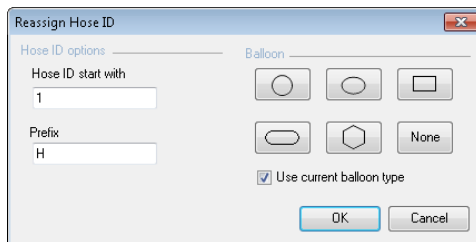
50.Reassign Hose ID

Reassign the Hose IDs of all symbols in the circuit after modification.

1. Click System >  on the HyDraw® CAD ribbon menu.
The Select Symbols prompt displays.
2. Select a single symbol or multiple symbols. Only hoses symbols will be included.
After completion of selection, press the **Enter** key.
The Reassign Hose ID dialog box displays.
3. Enter the starting value of the Hose ID.
4. Enter the Prefix.
5. Choose the Balloon shape.

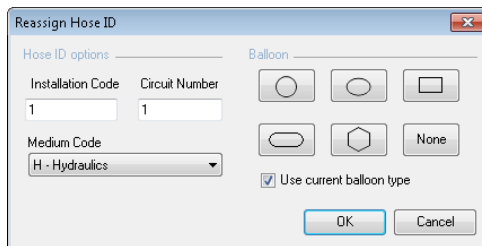
Select the checkbox, if you want to use the current balloon type.

6. Click **OK**.
7. For ISO 1219 Scheme, enter the **Installation Code**, **Circuit Number** and **Medium Code**.



The dialog box is titled "Reassign Hose ID". It has two tabs: "Hose ID options" and "Balloon". Under "Hose ID options", there is a "Hose ID start with" text box containing the number "1" and a "Prefix" text box containing the letter "H". Under "Balloon", there are five button icons representing different balloon shapes: a circle, an oval, a rectangle, a rounded rectangle, and a hexagon. The "None" button is also present. A checkbox labeled "Use current balloon type" is checked. At the bottom right are "OK" and "Cancel" buttons.

Reassign Hose ID




This dialog box is titled "Reassign Hose ID" and is specifically for the ISO 1219 Scheme. It has the same "Hose ID options" and "Balloon" tabs. Under "Hose ID options", there are three text boxes: "Installation Code" with "1", "Circuit Number" with "1", and "Medium Code" with a dropdown menu showing "H - Hydraulics". The "Balloon" section is identical to the previous dialog, with five shape buttons and a checked "Use current balloon type" checkbox. "OK" and "Cancel" buttons are at the bottom right.

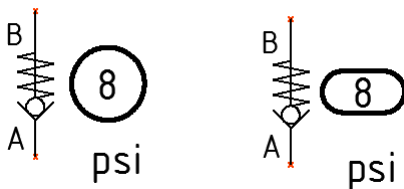
Reassign Hose ID – ISO 1219 Scheme

51.Recreate Balloons

*Update balloons of selected symbols or schematic.
This affects the type of balloons.*

1. Click System > **Balloon**  on the HyDraw® CAD ribbon menu.
The Select Symbols prompt displays.
2. Select a single symbol or multiple symbols.
After completion of selection, press the **Enter** key.
*The Specify Balloon type prompt displays.
[Circle/Ellipse/Rectangle/Rounded rectangle/Hexagon/None/Use current balloon type]*

3. Specify the balloon type.
4. Click **OK**.



Changing Balloon from Circle to Rounded rectangle

52.Add New Display Format


Add a new display format of selected symbols and connections.

1. Click System > **Display Format**  on the HyDraw® CAD ribbon menu.

The Select Symbols and Connections prompt displays.

2. Select a single symbol or multiple symbols or connections.
After completion of selection, press the **Enter** key.

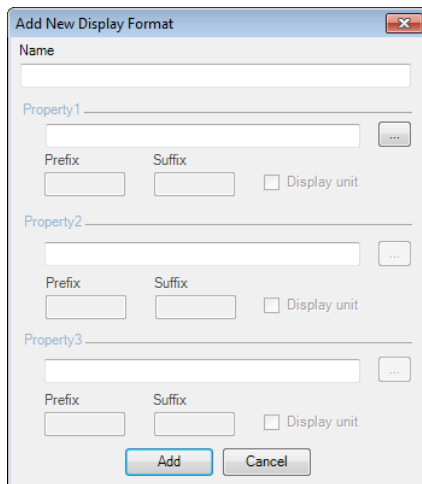
The Add New Display format dialog box displays.

3. Enter the name of the display format.
4. Click  on Property1 section to select property to display in the required format.

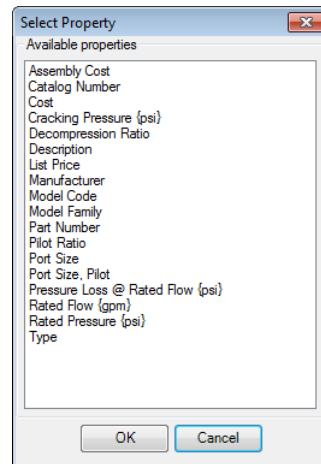
The Select Property dialog box displays.

- Select property and click **OK**.

5. Enter prefix and suffix values to be displayed.
6. Select the Display unit check box to display units.
7. Repeat step 4 to select more than one and up to three properties to display in this display format.
8. Click **Add**.

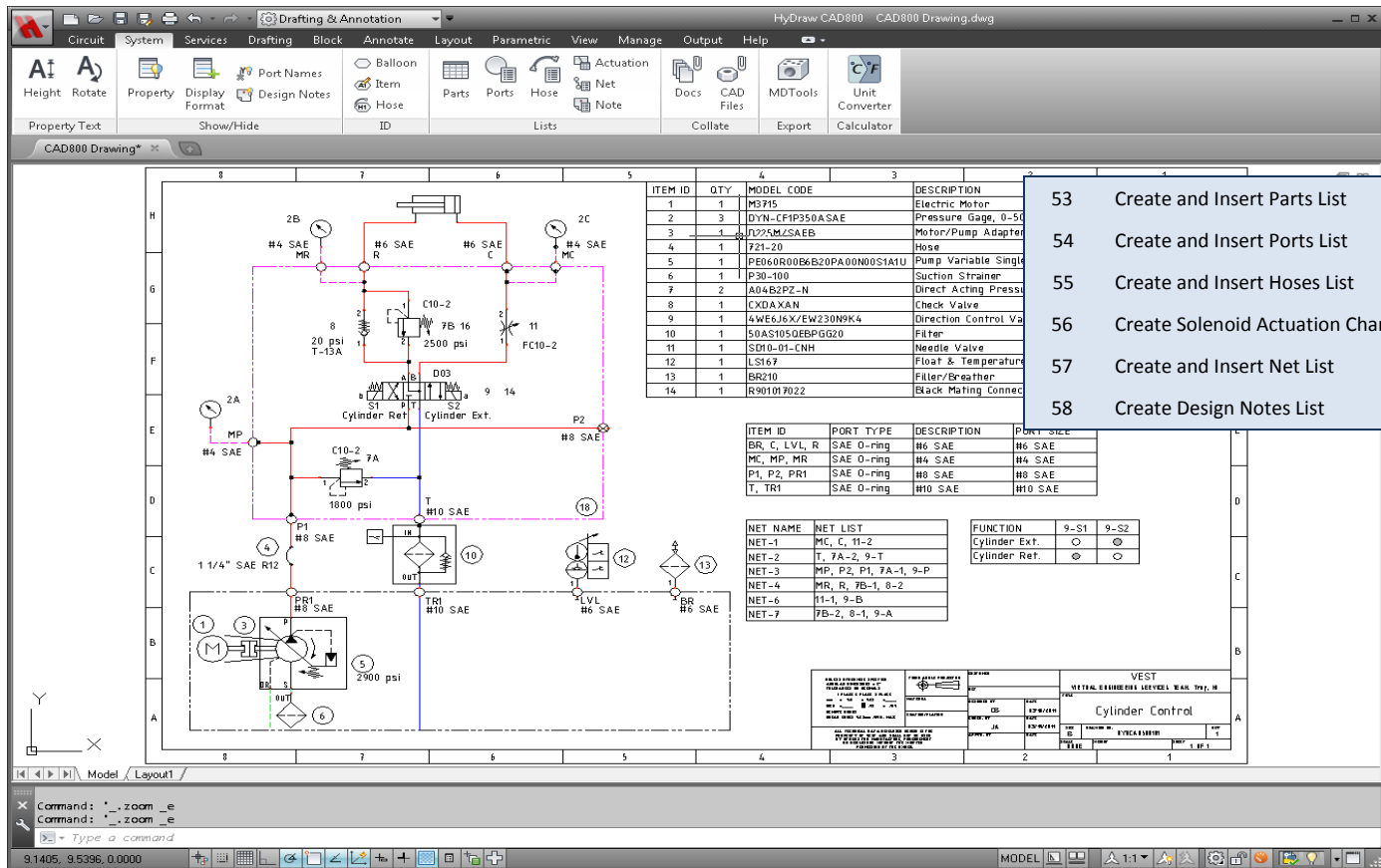


Add New Display Format dialog box



Select Property

Lists



53.Create and Insert Parts List

Create a list of components, envelope and accessories for a schematic.

1. Insert Parts List

1. Click System > **Parts List**  on the HyDraw® CAD ribbon menu.

The Select Symbols prompt displays.

2. Select a single or multiple symbols.
After completion of the selection, press the **Enter** key.
The Create Parts List dialog box displays.

3. Select the items to be included by clicking the required checkboxes,

Components - include all components in the Parts list.

Component accessories - include all component accessories in the Parts list.

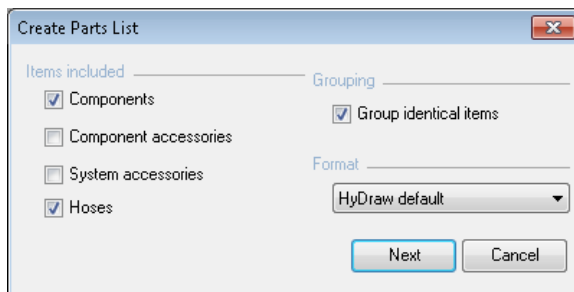
System accessories - include all system accessories in the Parts list.

Group identical items - group all the identical items in the Parts list.

Uncheck the **Hoses** option to exclude hoses from the selection.




Group identical items work only for 1A, 1B, 2A, 2B..., 1,1,2,2,..., 1.1,1.2,2.1,2.2..., and 1-1,1-2,2-1,2-2... numbering scheme.

4. Select the required **format**.
The default format is applied, if nothing is selected.
5. Click **Next**



Create Parts List dialog box

The Create Parts List dialog box displays the details of the Parts properties.

6. Click  or  to move the selected item row up or down, respectively.
7. Click  to delete the selected item from the list.
8. Click **Insert to Drawing** to insert the Parts list as a separate list in the drawing.
9. Select an area to create Parts List.
10. Specify the first corner.

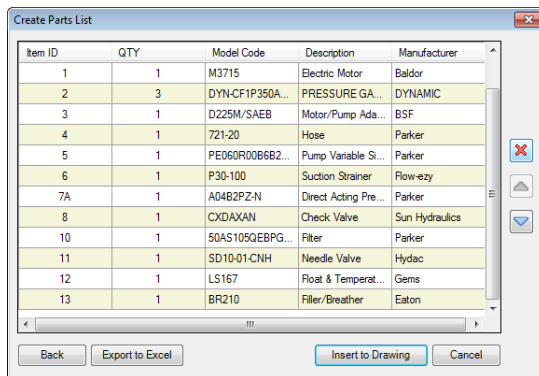
The Specify opposite corner: prompt displays.

11. Specify the opposite corner.

The Parts list is inserted into the drawing in a tabular form.

12. To save the Parts list as an Excel sheet, click **Export to Excel**.

The Parts List is saved in the Excel format.



Create Parts List dialog box


ITEM ID	QTY	MODEL CODE	DESCRIPTION	MANUFACTURER
1	1	M3715	Electric Motor	Baldor
2	3	DYN-CF1P350ASAE	Pressure Gage, 0-5000 PSI	DYNAMIC
3	1	D225M/SAEB	Motor/Pump Adapter	BSF
4	1	721-20	Hose	Parker
5	1	PE060R00B6B20PA00N00S1A1U	Pump Variable Single	Parker
6	1	P30-100	Suction Strainer	Flow-ezy
7	2	A04B2PZ-N	Direct Acting Pressure Relief Valve	Parker
8	1	CXDAXAN	Check Valve	Sun Hydraulics
9	1	4WE6J6X/EW230N9K4	Direction Control Valve	Bosch Rexroth
10	1	50AS105QEBPGG20	Filter	Parker
11	1	SD10-01-CNH	Needle Valve	Hydac
12	1	LS167	Float & Temperature Switch	Gems
13	1	BR210	Filler/Breather	Eaton
14	1	R901017022	Black Mating Connector	Bosch Rexroth


Parts List inserted in the drawing

2. Customize Parts List Format

1. Click Circuit > **Options...** on the HyDraw® CAD ribbon menu.
2. Click the **Lists & Charts** tab and select **Parts List**.

The Parts List formatting box displays inside the tab.

3. To rename a selected format, type the new name in the text box and click .

4. To add a new format, type the new name in the text box and click .

5. To delete a selected format, click  below the textbox.

*The **Configure Columns** section enables to edit Display Name, Alignment, and Width of the columns.*

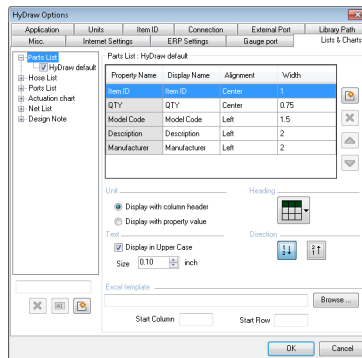
6. Click **Add**.

The Select Parts List Columns dialog box displays.

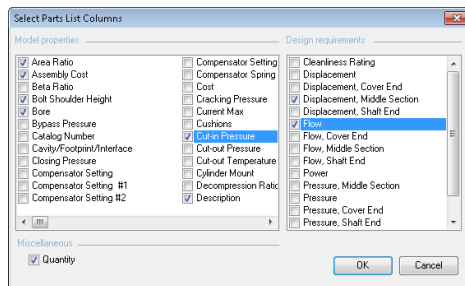
7. Select the required Model properties or Design requirements checkbox.
8. Click **Browse** and select the Excel template.
9. Set the Start Column and the Start Row of the Parts list to be inserted into the Excel template.
10. Click **OK**.

The properties of the selected items are displayed in the Parts List formatting box in the Configure columns section.

Same properties are displayed in the tabular form Parts list, when creating Parts list in the drawing.



Lists & Chart Tab: Parts List




Select Parts List Columns dialog box




54.Create and Insert Ports List

Create a list of external ports used in the circuit. You can insert this list in the drawing. The tabular list exhibits details about the external ports.

1. Insert Ports List

- 1. Click System > **Ports List**  on the HyDraw® CAD ribbon menu.
The Select Ports prompt displays.
- 2. Select a single or multiple ports. After the completion of selection, press the **Enter** key.
The Create Ports List dialog box displays.
- 3. Select the **Group identical items** checkbox to group all identical items in the Ports list.
- 4. Select the required **format**.
If no format is selected, then the default format is applied.
- 5. Click **Next** to display the Create Ports List dialog box.

The Create Ports List dialog box displays the details of the port properties.

- 6. Click  or  to move the selected item row up or down, respectively.
- 7. Click  to delete the selected port from the list.
- 8. Click **Insert to Drawing** to insert the Ports list as a separate list in the drawing.
- 9. Select an area to create the Ports List.

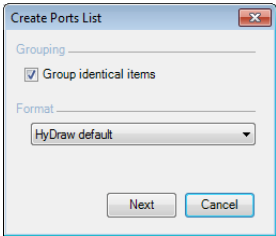
Specify first corner: prompt displays.

- 10. Specify the first corner.
The Specify opposite corner: prompt displays.
- 11. Specify the opposite corner.

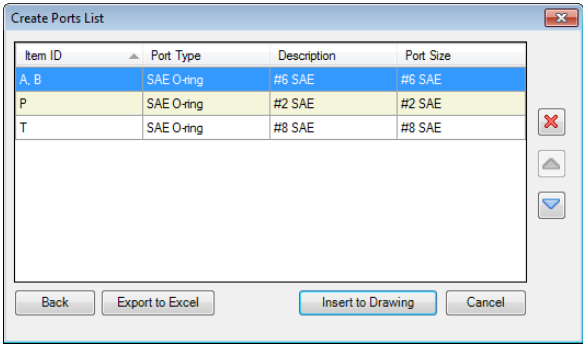
The Ports list is inserted into the drawing in a tabular form.

- 12. To save the Ports list as an Excel sheet, click **Export to Excel**.

The Ports List is saved in the Excel format.



Create Ports List dialog box



Create Ports List

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
A, B	SAE O-ring	#6 SAE	#6 SAE
P	SAE O-ring	#2 SAE	#2 SAE
T	SAE O-ring	#8 SAE	#8 SAE


Ports List in the drawing

2. Customize Ports List Format

1. Click Circuit > **Options...** on the HyDraw® CAD ribbon menu.

2. Click the **Lists & Charts** tab and select **Ports List**.

The Ports list formatting box displays inside the tab.

3. To rename a selected format,
type the new name in the textbox and click .

4. To add a new format,
type the new name in the textbox and click  below the text box.

5. To delete a selected format, click .

*The **Configure Columns** section enables editing of the Display Name, Alignment, and Width of the columns.*

6. Click .

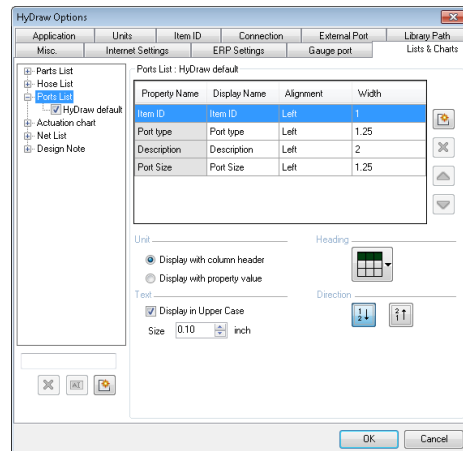
The Select Ports List columns dialog box displays.

7. Select the required properties.

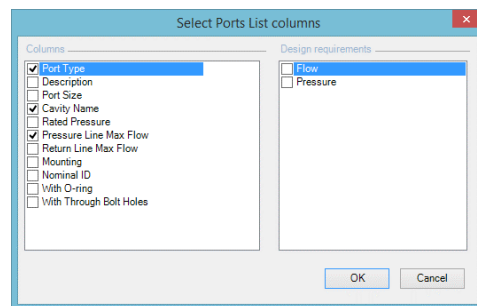
8. Click **OK**.

The properties of the selected item are displayed in the Ports List formatting box in the Configure columns section.

Same properties are displayed in the tabular form Ports list, when creating the Ports list in the drawing.



Ports List tab







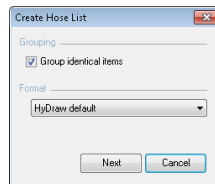
Select Ports List columns

55.Create and Insert Hose List

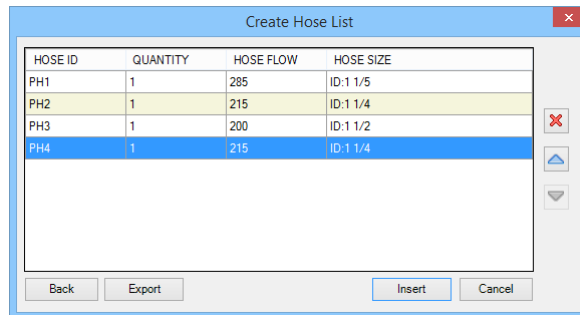
Create a list of hoses used in the circuit. You can insert this list in the drawing. The tabular list exhibits details about the hoses.

1. Insert Hose List

1. Click System > **Hose List**  on the HyDraw® CAD ribbon menu.
The Select Hoses prompt displays.
2. Select a single or multiple hoses. After the completion of selection, press the **Enter** key.
The Create Hoses List dialog box displays.
3. Select the **Group identical items** checkbox to group all identical items in the Hose list.
Group identical items works only for the given *numbering* scheme in Option.
4. Select the required **format**. If no format is selected, then the default format is applied.
5. Click **Next** to display the Create Hose List dialog box.
The Create Hose List dialog box displays the details of the hoses properties.
6. Click  or  to move the selected item row up or down, respectively.
7. Click  to delete the selected hose from the list.
8. Click **Insert to Drawing** to insert the hose list as a separate list in the drawing.
9. Select an area to create the Hose List.
Specify first corner: prompt displays.
10. Specify the first corner.
The Specify opposite corner: prompt displays.
11. Specify the opposite corner.
The Hose list is inserted into the drawing in a tabular form.
12. To save the Hose list as an Excel sheet, click **Export to Excel**.
The Hose List is saved in the Excel format.



Create Hose List dialog box






Create Hose List

HOSE NO.	QUANTITY	HOSE FLOW	HOSE SIZE
PH1	1	285	ID:1 1/5
PH2	1	215	ID:1 1/4
PH3	1	200	ID:1 1/2
PH4	1	215	ID:1 1/4

Hoses List in the drawing

2. Customize Hose List Format

1. Click Circuit > **Options...** on the HyDraw® CAD ribbon menu.
2. Click the **Lists & Charts** tab and select **Hose List**.
The Hose list formatting box displays inside the tab.
3. To rename a selected format, type the new name in the textbox and click .
4. To add a new format, type the new name in the textbox and click  below the text box.
5. To delete a selected format, click .

*The **Configure Columns** section enables editing of the Display Name, Alignment, and Width of the columns.*

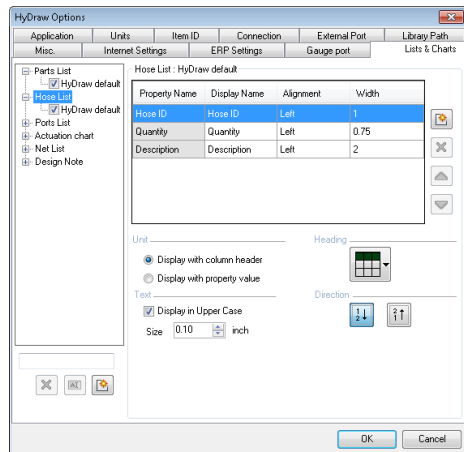
6. Click .

The Select Hose List columns dialog box displays.

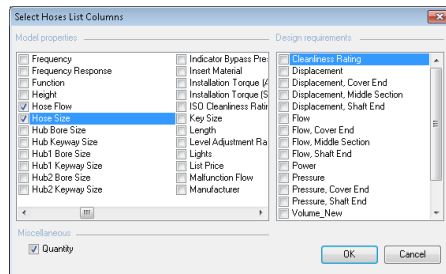
7. Select the required properties.
8. Click **OK**.

The properties of the selected item are displayed in the Hose List formatting box in the Configure columns section.

Same properties are displayed in the tabular form Hose list, when creating the Hose list in the drawing.








List & Chart Tab - Hose List



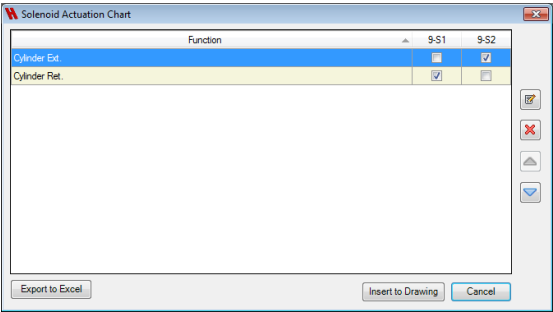
Select Hose List columns

56.Create Solenoid Actuation Chart

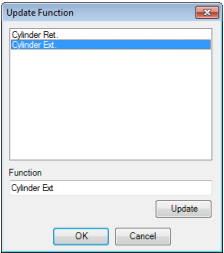
Insert the Solenoid Actuation chart in the drawing.

1. Click Circuit > **Actuation**  on the HyDraw® CAD ribbon menu.
The Select Symbols prompt displays.
2. Select a single or multiple symbols. After the completion of selection, press the **Enter** key.
The Use Item ID [Yes No] <Yes> prompt displays.
3. Press **Enter**.
The Solenoid Actuation Chart displays Function, Item ID-Solenoid ID, if applicable.
4. Click the **Update**  button to update the function name.
The Update Function dialog box displays.
 - Select the function to update.
 - Rename the function.
 - Click **Update**.
 - Click **OK** to display the changes in the Solenoid Actuation chart.
5. Click  or  to move the selected item one row up or one row down, respectively.
6. Click  to delete the selected function from the list.
7. Click **Export to Excel** to save the Solenoid Actuation chart as an Excel file (.xls or .xlsx).
8. Click **Insert to Drawing** to insert the Solenoid Actuation chart into the drawing.

❖ You can customize the Actuation List Format from HyDraw Option.



Solenoid Actuation Chart – Grid View






Update Function

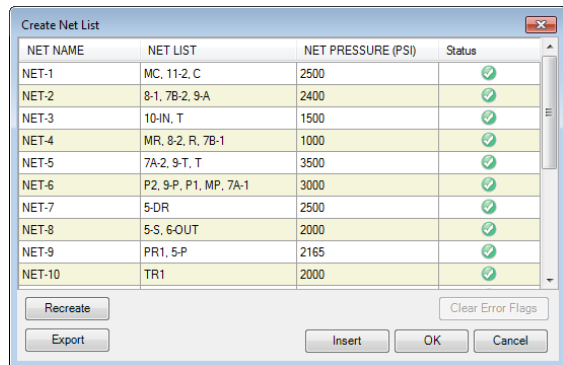
FUNCTION	9-S1	9-S2
Cylinder Ext.	<input type="radio"/>	<input checked="" type="radio"/>
Cylinder Ret.	<input checked="" type="radio"/>	<input type="radio"/>











Solenoid Actuation Chart

57.Create and Insert Net List

Create a list of networks (Net List) of components and external ports in the circuit.
You can insert the Net list in the drawing. The tabular list exhibits details about the networks.

- Click System > **Net List**  on the HyDraw® CAD ribbon menu.
The Select Symbols and Connections prompt displays.
- Select symbols and connections. After completion of selection, press the **Enter** key.
The Create Net List box displays net name with the corresponding net items and status.
- Enter the Net Pressure for the whole net.
It will update the pressure of all the symbols in the net.
The Status column shows the accounted nets with  and amended nets with  indicating that the nets are amended and require recreation.
By selecting a net on the Status column, the respective net is shown as hidden in the drawing.
(In case of hidden connection lines at low zoom level, the hidden preview may not be visible. If the connection is not correct, red dots appear along the connection points.)
- Click **Clear Error Flags** to remove the error flags from the drawing.
- Click **Recreate** to return to create the Net list.
- Click **Export** to save the Net list as an Excel file (.xls or .xlsx).
- Click **Insert** to insert the Net list in the drawing.
- Select an area to create the Net list.
The Specify first corner prompt displays.
- Specify the first corner.
The Specify opposite corner: prompt displays.
- Specify the opposite corner.
The Net list is inserted into the drawing.
- Click **OK** to exit or Click **Cancel** to cancel the Net list creation.



NET NAME	NET LIST	NET PRESSURE (PSI)	Status
NET-1	MC, 11-2, C	2500	
NET-2	8-1, 7B-2, 9-A	2400	
NET-3	10-IN, T	1500	
NET-4	MR, 8-2, R, 7B-1	1000	
NET-5	7A-2, 9-T, T	3500	
NET-6	P2, 9-P, P1, MP, 7A-1	3000	
NET-7	5-DR	2500	
NET-8	5-S, 6-OUT	2000	
NET-9	PR1, 5-P	2165	
NET-10	TR1	2000	

Buttons: Recreate, Export, Insert, OK, Cancel, Clear Error Flags

Create Net List

NET NAME	NET LIST	NET PRESSURE (PSI)
NET-1	MC, C, 11-2	2500
NET-2	7B-2, 8-1, 9-A	2400
NET-3	10-IN, T	1500
NET-4	MR, R, 7B-1, 8-2	1000
NET-5	T, 7A-2, 9-T	3500
NET-6	MP, P2, P1, 7A-1, 9-P	3000
NET-7	5-DR	2500
NET-8	6-OUT, 5-S	2000
NET-9	PR1, 5-P	2165
NET-10	TR1	2000

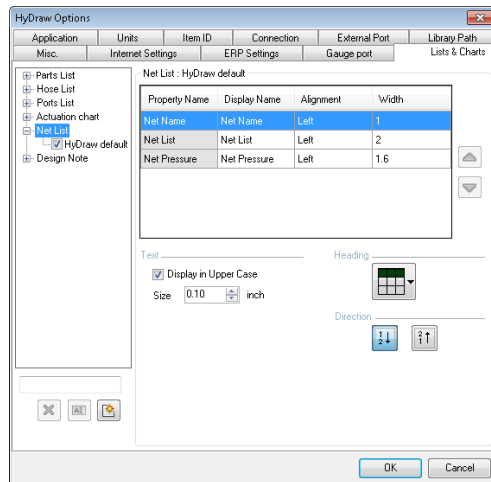
Net List

Note:

The individual symbols of Slip-Cartridge valve cover and Insert are combined with “&” and treated as a single entity, when creating the Net list.

CAUTION!





- Do not create more than one connection to the connection points. This may result in an incorrect Net list.
 - If **OK** is not pressed after net renaming, the corrections will be lost on recreation, with default net naming style.
- ❖ You can customize the Net List Format from HyDraw Option.



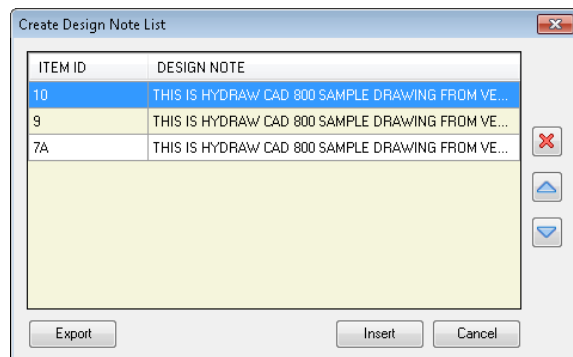
HyDraw Option-Net List

58.Create Design Note List

Create Design notes list in the circuit and insert it in the drawing.

1. Click System > Notes  on the HyDraw® CAD ribbon menu.
The Select Symbols and Connections prompt displays.
2. Select symbols and connections.
After completion of selection, press the **Enter** key.
The Create Design Note List box displays.
3. Click  or  to move the selected item one row up or one row down, respectively.
4. Click  to delete the selected function from the list.
5. Click **Export** to save the Design Note list as an Excel file (.xls or .xlsx).
6. Click **Insert** to insert the Design Note list in the drawing.
7. Select an area to create the Design Note list.
The Specify first corner prompt displays.
8. Specify the first corner.
The Specify opposite corner: prompt displays.
9. Specify the opposite corner.
The Design Notes list is inserted into the drawing.
10. Click **OK** to exit or Click **Cancel** to cancel the Design Note list creation.

❖ You can customize the Design Note List Format from HyDraw Option.



Create Design Notes List

ITEM ID	DESIGN NOTE
10	THIS IS HYDRAW CAD 800 SAMPLE DRAWING FROM VEST,INC.
9	THIS IS HYDRAW CAD 800 SAMPLE DRAWING FROM VEST,INC.
7A	THIS IS HYDRAW CAD 800 SAMPLE DRAWING FROM VEST,INC.

Design Notes List

Collate Files

CAD800 Drawing.dwg

Collate Documents

Collate CAD Files

Item ID QTY MODEL CODE DESCRIPTION MAN

1	1	M3P15	Electric Motor	Bald
2	3	DYN-CFIP350ASAE	Pressure Gage, 0-5000 PSI	DYN
3	1	JU72UM/SAEB	Motor/Pump Adapter	BSP
4	1	F21-20	Hose	Parker
5	1	PE06UR006B20PA00N00S1A1U	Pump Variable Single	Parker
6	1	P30-100	Suction Strainer	Flow-key
7	2	A04B2P2-N	Direct Acting Pressure Relief Valve	Parker
8	1	OXDAXAN	Check Valve	Sun Hydraulics
9	1	4WE6J6X/EW230N9K4	Direction Control Valve	Bosch Rexroth
10	1	50AS1050EBPGG20	Filter	Parker
11	1	SD10-01-CNH	Needle Valve	Hydac
12	1	LS167	Float & Temperature Switch	Gems
13	1	BR210	Filter/Breather	Eaton
14	1	R9010R022	Block Mating Connector	Bosch Rexroth

Item ID PORT TYPE DESCRIPTION PORT SIZE

BR, C, LVL, R	SAE 0-mq	#6 SAE	#6 SAE
MC, MP, MR	SAE 0-mq	#4 SAE	#4 SAE
P1, P2, PR1	SAE 0-mq	#8 SAE	#8 SAE
T, TR1	SAE 0-mq	#10 SAE	#10 SAE

NET NAME NET LIST

NET-1	MC, C, T1-2
NET-2	T, 7A-2, 9-T
NET-3	MP, P2, P1, 7A-1, 9-P
NET-4	MR, R, 7B-1, 8-2
NET-6	T1-1, 9-B
NET-7	7B-2, 8-1, 9-A

FUNCTION

9-S1	9-S2
Cylinder Ext.	○
Cylinder Ret.	⊗

VEST

NETS EXTERNAL LINES VSA, TYP, N

Cylinder Control

Model / Layout


Command: .zoom_e
Command: .zoom_e
Type a command

9.1405, 9.5396, 0.0000

MODEL

59.Collate Documents

Save documents linked to components, component accessories, and system accessories in the user-specified location.

1. Click System > **Collate Documents**  from the Collate option on the HyDraw® CAD ribbon menu.

The Collate Documents dialog box displays.

The Select Symbols prompt displays.

2. Select a single symbol or multiple symbols and then press the **Enter** key.

The Specify items included [Components/Accessories/Include all/More options] < Include All> prompt displays.

3. Specify the item and press the **Enter** key.

- a. Select Components/Accessories/Include All:

The Collate Documents dialog box displays.

- b. Select the documents to be collated.

- c. Click **OK**.

- d. Select More Options:

The Include components [Yes/No]: prompt displays.

- e. Enter Yes or No and press the Enter key.

The Include component accessories [Yes/No]: prompt displays.

- f. Enter Yes or No and press the Enter key.

The Include system accessories [Yes/No]: prompt displays.

- g. Enter Yes or No and press the Enter key.

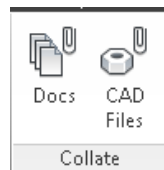
The Collate Documents dialog box displays.

- h. Select the documents to be collated.

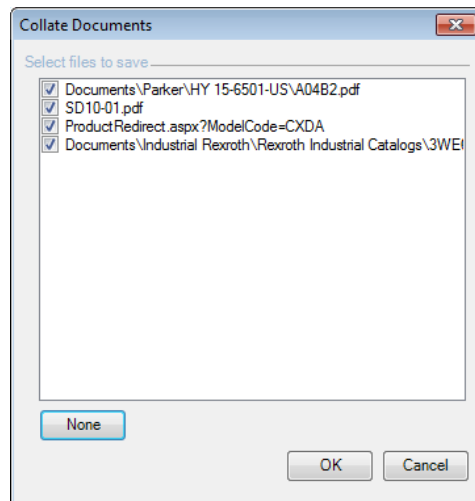
- i. Click OK.

The Browse For Folder dialog box displays.

4. Select the appropriate folder or click **Make New Folder** to create a new folder at the appropriate location for saving documents.




Collate Documents dialog box



Collate Documents: save files

60.Collate CAD Files

Save the CAD files linked to the component, component accessories, and system accessories in the user-specified location.

1. Click System > **Collate CAD Files**  from the Collate option on the HyDraw® CAD ribbon menu.

The Select Symbols prompt displays.

2. Select a single symbol or multiple symbols and press the **Enter** key.

The Specify items included [Components/Accessories/Include all/More options] <Include All> prompt displays.

3. Specify the item and press the **Enter** key.

- a. Select Components/Accessories/Include All:

The Collate CAD Files dialog box displays.

- b. Select the CAD Files to be collated.

- c. Click **OK**.

- d. Select More Options:

The Include components [Yes/No]: prompt displays.

- e. Enter Yes or No and press the Enter key.

The Include component accessories [Yes/No]: prompt displays.

- j. Enter Yes or No and press the Enter key.

The Include system accessories [Yes/No]: prompt displays.

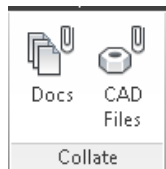
- f. Enter Yes/ No and press the Enter key.

The Collate CAD Files dialog box displays.

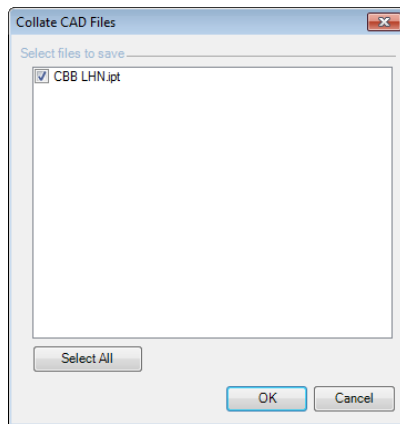
- g. Select the CAD files to be collated.

- h. Click OK.

4. Select the appropriate folder or click **Make New Folder** to create a new folder in the appropriate location for saving CAD files.



Collate CAD Files dialog box



Collate CAD Files: Save Files

Calculator

HyDraw CAD800 CAD800 Drawing.dwg

Circuit System Services Drafting Block Annotate Layout Parametric View Manage Output Help

Height Rotate Property Display Format Port Names Design Notes Actuation Hose Net Note Docs CAD Files MDTools Unit Converter

Property Text Show/Hide ID Lists Collate Export Calculator

CAD800 Drawing*

The software interface displays a hydraulic circuit diagram on the left, a parts list table on the right, and a unit converter table below the parts list. The circuit diagram includes components like a motor, pump, valves, and cylinders, with various ports and pressures labeled. The parts list table lists items with their IDs, quantities, model codes, descriptions, and manufacturers. The unit converter table shows conversion factors for different units.

ITEM ID	QTY	MODEL CODE	DESCRIPTION	MANUFACTURER
1	1	M3F15	Electric Motor	
2	3	Q1N-CFIP350ASAE	Pressure Gage, 0-5000 PSI	
3	4	J225M/LSAEB	Motor/Pump Adapter	
4	1	Z21-20	Hose	Parker
5	1	PE060R00B6B20PA00N00S1A1U	Pump Variable Single	Parker
6	1	P30-100	Suction Strainer	Flow-ezy
7	2	A04B2PZ-N	Direct Acting Pressure Relief Valve	Parker
8	1	CXDAXAN	Check Valve	Sun Hydraulics
9	1	4WE6J6X/EW230N9K4	Direction Control Valve	Bosch Rexroth
10	1	50A31050EBPGG20	Filter	Parker
11	1	SD10-01-CNH	Needle Valve	Hydac
12	1	LS167	Float & Temperature Switch	Gems
13	1	BR210	Filter/Breather	Eaton
14	1	R901017022	Block Mating Connector	Bosch Rexroth

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
BR, C, LVL, R	SAE 0-rng	#6 SAE	#6 SAE
MC, MP, MR	SAE 0-rng	#4 SAE	#4 SAE
P1, P2, PR1	SAE 0-rng	#8 SAE	#8 SAE
T, TR1	SAE 0-rng	#10 SAE	#10 SAE

NET NAME	NET LIST	FUNCTION	9-S1	9-S2
NET-1	MC, C, 11-2	Cylinder Ext.	<input type="radio"/>	<input type="radio"/>
NET-2	T, 7A-2, 9-T	Cylinder Ret.	<input type="radio"/>	<input type="radio"/>
NET-3	MP, P2, P1, 7A-1, 9-P		<input type="radio"/>	<input type="radio"/>
NET-4	MR, R, 7B-1, 8-2		<input type="radio"/>	<input type="radio"/>
NET-5	11-1, 9-B		<input type="radio"/>	<input type="radio"/>
NET-7	PB-2, 8-1, 9-A		<input type="radio"/>	<input type="radio"/>

VEST
CYLINDER CONTROL

Command: .zoom_e
Command: .zoom_e
Type a command

9.1405, 9.5396, 0.0000

MODEL 1:1

61. Unit Converter

Convert value of any unit category from any unit to the other.

1. Click System > **Unit Converter** from the Calculator option on the HyDraw® CAD ribbon menu.




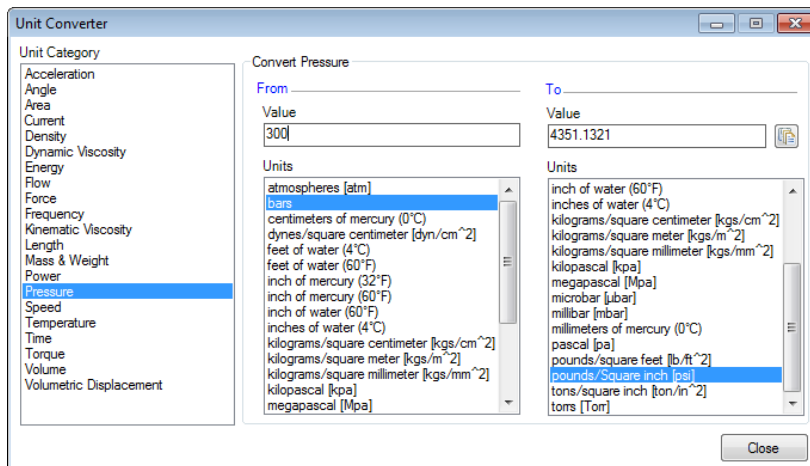
The Unit Converter dialog box displays.

HyDraw Unit Converter

2. Select a unit category.
3. Select the units system in the **From** and **To** Units list box, per requirement.
4. Specify the unit value in the **From** text box.

Converted units value appears in the **To** text box in the desired unit system.

5. Click  to copy the **To** value to the clipboard.



Unit Converter dialog box

MDTools Interface

MDTools HyDraw Interface

C:\ExportToMDTools.xml Browse...

Cavity Browser

Demo Schematic

Connectivity Browser

Cavity Information

Component ID: 8

Cavity Name: Sun T-13A

Cavity Type: Cartridge Valve Cavity

Comments: Sun Hydraulics T-13A (Inch), Rev.L

Net Information

Port 1 Net Name: NET-7

Port 2 Net Name: NET-4

☐ Edit Net Name

Update

Insert Cavity OK Cancel <<

HyDraw CAD800 CAD800 Drawing.dwg

Parametric View Manage Output Help

Actuation Net Docs CAD Files MDTools Unit Converter

Lists Collate Export Calculator

ITEM ID	QTY	MODEL CODE	DESCRIPTION	MANUFACTURER
1	1	M3P15	Electric Motor	Baldor
2	3	DYN-CFIP350ASAE	Pressure Gauge, 0-5000 PSI	DYNAMIC
3	1	J27M/SAEB	Motor/Pump Adapter	BSP
4	1	P21-20	Hose	Parker
5	1	PE06R000KB20PA00N001A1U	Pump Variable Single	
6	1	P30-100	Suction Strainer	
7	2	A04B2P2-N	Direct Acting Pressure Relief Valve	
8	1	CXDAXAN	Check Valve	Sun Hydraulics
9	1	4WE6J6X/EW230N9K4	Direction Control Valve	Bosch Rexroth
10	1	50AS105GEPG020	Filter	Parker
11	1	SD10-01-CN1	Needle Valve	Hydac
12	1	LS167	Float & Temperature Switch	Gens
13	1	BR210	Filter/Breather	Eaton
14	1	R90101R022	Block Mating Connector	Bosch Rexroth

ITEM ID	PORT TYPE	DESCRIPTION	PORT SIZE
BR, C, LVL, R	SAE O-ring	#6 SAE	#6 SAE
MC, MP, MR	SAE O-ring	#4 SAE	#4 SAE
P1, P2, PR1	SAE O-ring	#8 SAE	#8 SAE
T, TR1	SAE O-ring	#10 SAE	#10 SAE

NET NAME	NET LIST	FUNCTION	9-S1	9-S2
NET-1	MC, C, 11-2	Cylinder Ext.	<input type="radio"/>	<input type="radio"/>
NET-2	T, 7A-2, 9-T	Cylinder Ret.	<input type="radio"/>	<input type="radio"/>
NET-3	MP, P2, P1, 7A-1, 9-P			
NET-4	MR, R, 7B-1, 8-2			
NET-6	11-1, 9-B			
NET-7	7B-2, 8-1, 9-A			

FUNCTION		VECT	
FUNCTION	VECT	FUNCTION	VECT
EXTENSION	RETRACT	EXTENSION	RETRACT
EXTENSION	RETRACT	EXTENSION	RETRACT
EXTENSION	RETRACT	EXTENSION	RETRACT

Command: .zoom_e
Command: .zoom_e
Type a command

9.1405, 9.5396, 0.0000

MODEL 1:1

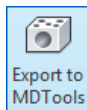
62 Export to MDTools

62.Export to MDTools

Export a HyDraw® CAD created circuit as an XML, which can be readily opened in MDTools® for designing a manifold.

1. Click System > **Export to MDTools** on the HyDraw CAD ribbon menu.

The Select Symbols and Connections prompt displays.

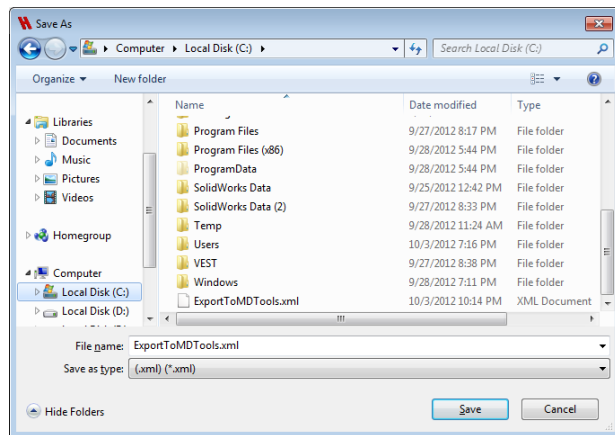


Export to MDTools sub-menu

2. Select symbols and connections from the drawing.
After completion of selection, press the **Enter** key.

The Save As dialog box displays.

3. Save the resulting XML file at the desired location.



Save As dialog box for XML

Note:

Information about CAD files linked to components is exported to MDTools so that it automatically assembles the component models on the block.

FluidPowerTools.com

The screenshot shows the FluidPowerTools.com website in a web browser. The browser's address bar displays "www.fluidpowertools.com". The website features a navigation bar with links for "Home", "About Us", "Contact Us", and "Subscribe". Below this, a horizontal menu contains "Component Data", "Manufacturers", "Tools", and "Services". The main content area is titled "Fluid Power Resources" and includes a large image of a man and a woman using tablets, with a world map in the background. To the right of this image is a "Questions?" section with a phone icon, the number "01 (248) 649 9550", and the email "support@VESTusa.com". Below the main content, there is a section for "Engineering and design data of Fluid Power components of major manufacturers delivered by FluidPowerTools.com", followed by logos for Rexroth Bosch Group, Eaton, Sun Hydraulics, HYDAC, Parker, SAUER DANFOSS, atos, and HYDRAFORCE. At the bottom, there is a footer with links for "Feedback", "Privacy", "Terms & Conditions, Disclaimer", and "Trademarks", along with the copyright notice "© 2013 VEST, Inc.".

FluidPowerTools.com : Cc x

www.fluidpowertools.com

Apps Google

Home | About Us | Contact Us | Subscribe

FLUID POWER TOOLS

Component Data Manufacturers Tools Services

Fluid Power Resources

Questions?
01 (248) 649 9550
email: support@VESTusa.com

63 Data Access Settings
64 Help for FluidPowerTools.com
65 Internet Settings

FluidPowerTools.com gives real time access to fluid power data and resources. It is promoted by VEST, Inc. the pioneer in engineering design software and services for the fluid power industry.

Engineering and design data of Fluid Power components of major manufacturers delivered by FluidPowerTools.com

Rexroth Bosch Group

EATON

SUN hydraulics

HYDAC

Parker

SAUER DANFOSS

atos

HYDRAFORCE High Performance Hydraulic Cartridge Valves and Electro-Hydraulic Control Systems

FluidPowerTools is a trademark of VEST, Inc. All other company and product names mentioned herein are trademarks or registered trademarks of their respective owners. FluidPowerTools is not affiliated to any of the manufacturers listed.

Feedback Privacy Terms & Conditions, Disclaimer Trademarks

© 2013 VEST, Inc.

63.Data Access Settings

Select Manufacturer database to search components.

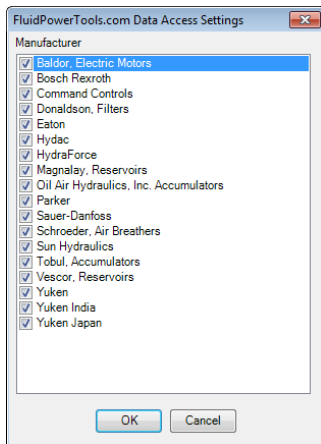
1. Click Services > **Data Access Settings** on the FluidPowerTools section in the HyDraw® CAD ribbon menu.



Data Access Settings Menu Item

The FluidPowerTools.com Data Access Settings dialog box displays.

2. Select the required Manufacturers from the list and click **OK**.



Data Access Settings dialog box

64.Help for FluidPowerTools.com

1. Subscription Information

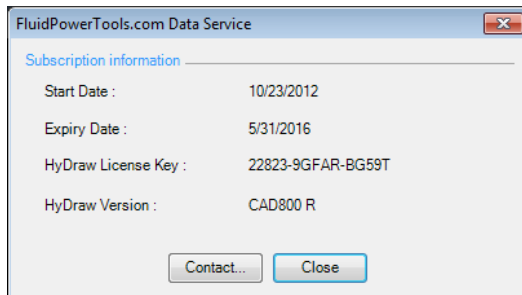
Know the HyDraw® version and subscription information.

- Click Services > **Subscription Information** on the FluidPowerTools section of the Services tab in the HyDraw CAD ribbon menu.



Help menu and submenu

The FluidPowerTools.com Data Service information box displays.



The FluidPowerTools.com Info

2. Component Data Available

Navigate to *FluidPowerTools.com*, where you can see the component data of major Fluid Power manufacturers.

- Click Services > **Component Data Available** on the FluidPowerTools section of the HyDraw® CAD ribbon menu.

The screenshot shows a web browser window displaying the 'Component Data Library from FluidPowerTools.com'. The page is titled 'Screw-in Cartridge Valves' and features a table of product availability for various manufacturers. The table includes columns for Bosch Rexroth, Command Controls, Eaton, Hydac, Hydra Force, Parker, Sauer Danfoss, and Sun Hydraulics. The rows list various valve types such as Check Valves, Pilot Op. Check Valves, Shuttle Valves, Flow Control Valves, Needle Valves, Flow Divider/Combiner Valves, Counterbalance and Load Control Valves, Pressure Relief Valves, Pressure Reducing Valves, Pressure Sequence Valves, Pressure Unloading Valves, Direction Control Valves (Manually Operated, Hydraulic Pilot Operated, Solenoid Operated), Logic Elements, Proportional Flow Control Valves, Proportional Pressure Relief Valves, Proportional Pressure Reducing Valves, Proportional Direction Control Valves, Accumulator Discharge Valves, and Hand pumps. Checkmarks indicate availability for each manufacturer.

Screw-in Cartridge Valves	Bosch Rexroth	Command Controls	Eaton	Hydac	Hydra Force	Parker	Sauer Danfoss	Sun Hydraulics
Check Valves	✓	✓	✓	✓	✓	✓	✓	✓
Pilot Op. Check Valves	✓	✓	✓	✓	✓	✓	✓	✓
Shuttle Valves	✓	✓	✓	✓	✓	✓	✓	✓
Flow Control Valves	✓	✓	✓	✓	✓	✓	✓	✓
Needle Valves	✓	✓	✓	✓	✓	✓	✓	✓
Flow Divider/Combiner Valves	✓	✓	✓	✓	✓	✓	✓	✓
Counterbalance and Load Control Valves	✓	✓	✓	✓	✓	✓	✓	✓
Pressure Relief Valves	✓	✓	✓	✓	✓	✓	✓	✓
Pressure Reducing Valves	✓	✓	✓	✓	✓	✓	✓	✓
Pressure Sequence Valves	-	-	✓	-	✓	✓	✓	✓
Pressure Unloading Valves	✓	✓	✓	-	✓	✓	✓	✓
Direction Control Valves - Manually Operated	-	-	✓	✓	✓	✓	✓	✓
Direction Control Valves - Hydraulic Pilot Operated	✓	✓	✓	-	✓	✓	✓	✓
Direction Control Valves - Solenoid Operated	✓	✓	✓	✓	✓	✓	✓	✓
Logic Elements	✓	✓	✓	✓	✓	✓	✓	✓
Proportional Flow Control Valves	✓	✓	✓	-	✓	✓	✓	✓
Proportional Pressure Relief Valves	✓	✓	✓	✓	✓	✓	✓	✓
Proportional Pressure Reducing Valves	✓	✓	✓	✓	✓	✓	✓	✓
Proportional Direction Control Valves	✓	✓	-	-	✓	✓	✓	-
Accumulator Discharge Valves	-	-	✓	-	-	-	-	✓
Hand pumps	✓	✓	✓	-	✓	-	-	-

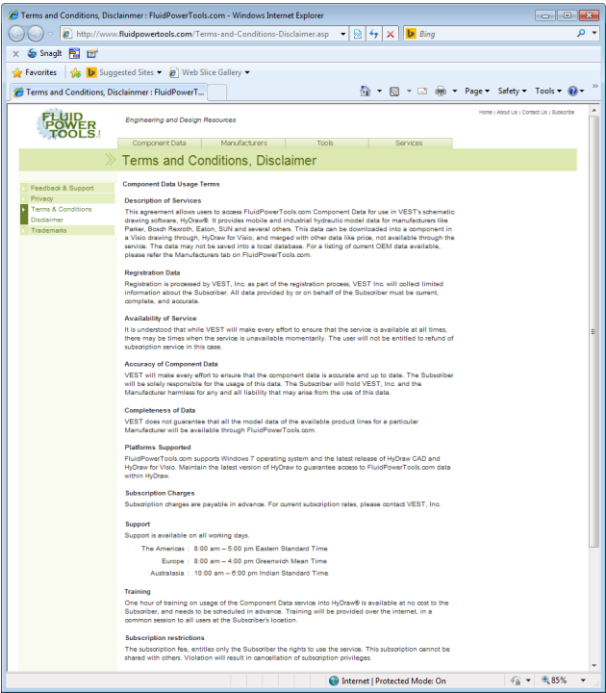
FluidPowerTools.com is working to provide more data libraries from other manufacturers including libraries of pumps, motors, gauges, accumulators, hoses, heat exchangers etc.
If you want your company data to be included, please contact VEST, Inc.

The FluidPowerTools.com Component Data

3. Terms of Usage

Navigate to FluidPowerTools.com, where you can see the terms and conditions of using the services on FluidPowerTools.com

- Click Services > **Terms of Usage** on the FluidPowerTools section on the HyDraw® CAD ribbon menu.

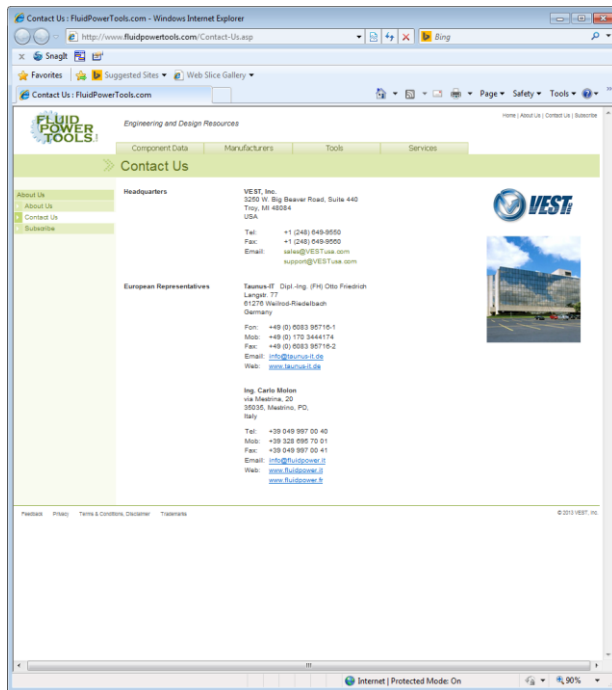


The FluidPowerTools.com Terms and Conditions, Disclaimer

4. Contact Info.

Navigate to *FluidPowerTools.com*, where you can find the contact information of the VEST team.

- Click Services > **Contact Info** on the FluidPowerTools section on the HyDraw® CAD ribbon menu.



The FluidPowerTools.com Contact Info

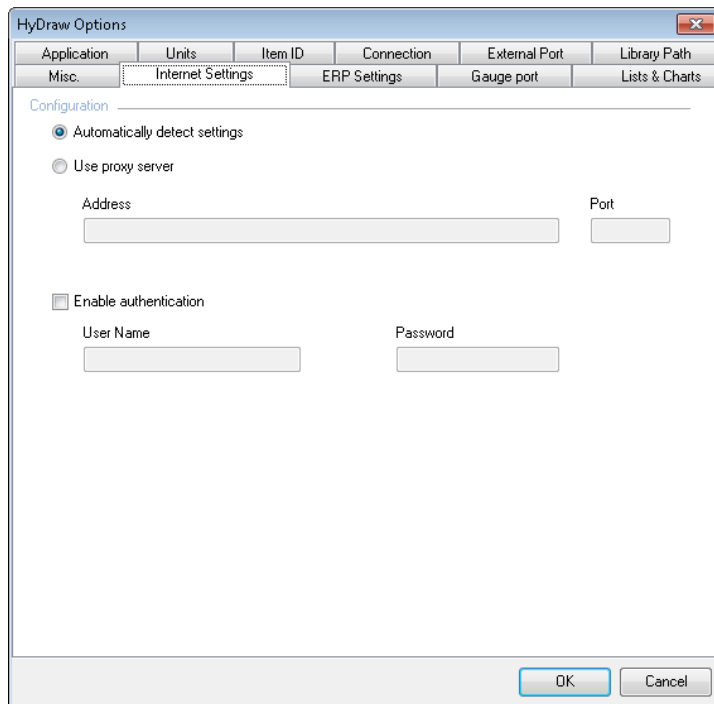
65. Internet Settings

Configure the Internet settings for FluidPowerTools.com.

1. Click Services > **Internet Settings** on the Setup section of the Services tab in the HyDraw® CAD ribbon menu.

The Internet Settings tab page displays.

2. Configure the connection, per requirement.
3. Click **OK** to apply and exit.



The screenshot shows the 'HyDraw Options' dialog box with the 'Internet Settings' tab selected. The dialog has a title bar with a close button. Below the title bar is a tabbed interface with tabs for 'Application', 'Units', 'Item ID', 'Connection', 'External Port', and 'Library Path'. The 'Internet Settings' tab is active, showing a 'Configuration' section with the following options:

- ☒ Automatically detect settings
- ☐ Use proxy server
 - Address:
 - Port:
- ☐ Enable authentication
 - User Name:
 - Password:

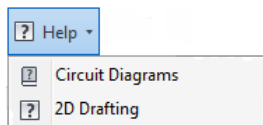
At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

HyDraw Options: Internet Settings

HyDraw CAD Help



66.Help



Help Command Menu and Sub menu

Circuit Diagrams

The Circuit diagram command opens the HyDraw® CAD⁸⁰⁰ user manual.

2D Drafting

The 2D Drafting command opens the 2D drafting help file for HyDraw CAD⁸⁰⁰.

67.About HyDraw

Displays product information.

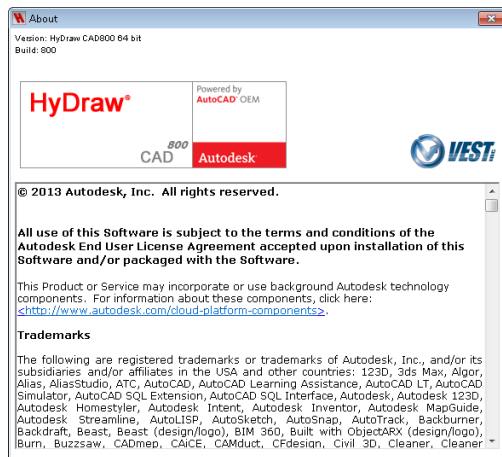


About
HyDraw

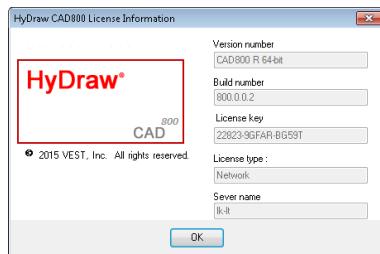
About HyDraw Menu item

Note:

In the Command line, type
LicenseInfo to get the license
information with Version Number,
Build number, Serial number and
License type details.

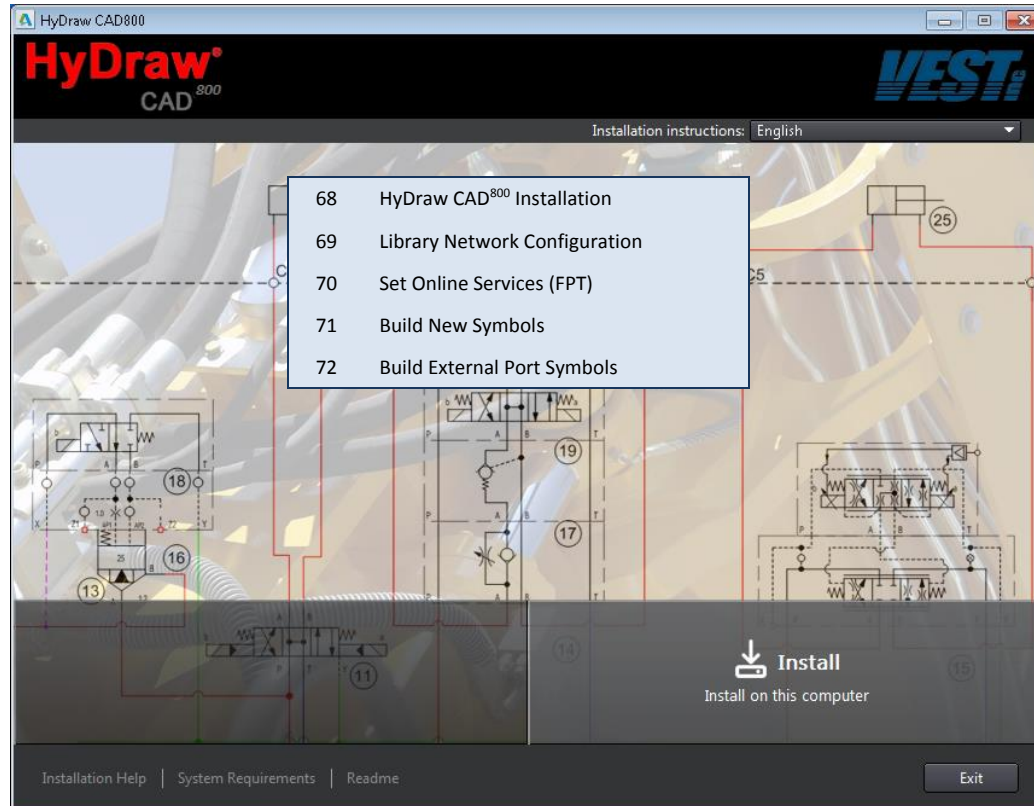


About HyDraw dialog box



HyDraw CAD⁸⁰⁰ License Info

Installation & Setup



68.HyDraw CAD⁸⁰⁰ Installation

The HyDraw® installation program installs HyDraw CAD⁸⁰⁰ on your computer.

1. System Requirements:

The system requirements are provided in the product documentation.

Software

- Microsoft Windows 7/8 (32/64-bit).
- Microsoft Internet Explorer® 7.0 or later.
- Adobe Reader 7.0 or higher.
- Excel 2007* or higher.

* Required only for exporting HyDraw data.

Hardware

- **Processor : 32-bit**
- Windows 7: Intel® Pentium 4 or AMD Athlon™ Dual Core, 3.0 GHz or higher with SSE2 technology
- **Processor : 64-bit**
- AMD Athlon 64 with SSE2 technology, AMD Opteron® processor with SSE2 technology,
- Intel® Xeon® processor with Intel EM64T support and SSE2 technology, or Intel Pentium 4 with Intel EM64T support and SSE2 technology.
- **Memory : 2 GB RAM (4 GB Recommended)**
- **Display Resolution : 1,024 x 768 display resolution with true color (1,600 x 1,050 with true color recommended)**
- **Hard Disk : 6.0 GB free disk space**

Note:

The minimum required configuration is only listed above; however it is recommended to use a higher hardware configuration for power users.

2. Software Installation

1. Run the self-extracting exe, **HyDraw CAD800.0.0.5 R x64 - EN Setup.exe/HyDraw CAD800.0.0.5 R x64 – IT/HyDraw CAD800.0.0.5 R x86 - EN Setup.exe/HyDraw CAD800.0.0.5 R x86 - IT Setup.exe** from the Downloaded installation and Unzip

or

Insert the HyDraw® CAD⁸⁰⁰ DVD into the DVD drive.

If Auto Run is not set, then:

- a) On the Start menu, click **Run**.
- b) Browse to the HyDrawCAD800.exe program on the DVD drive.
- c) Select **HyDrawCAD800.exe** and click **Open**.
- d) Click **OK**.

The HyDraw CAD installation program dialog box displays.

2. Click **Install Products** to install the HyDraw CAD application.
3. Accept the **License Agreement** and click **Next**.

The Software can be configured for both typical and custom installation.

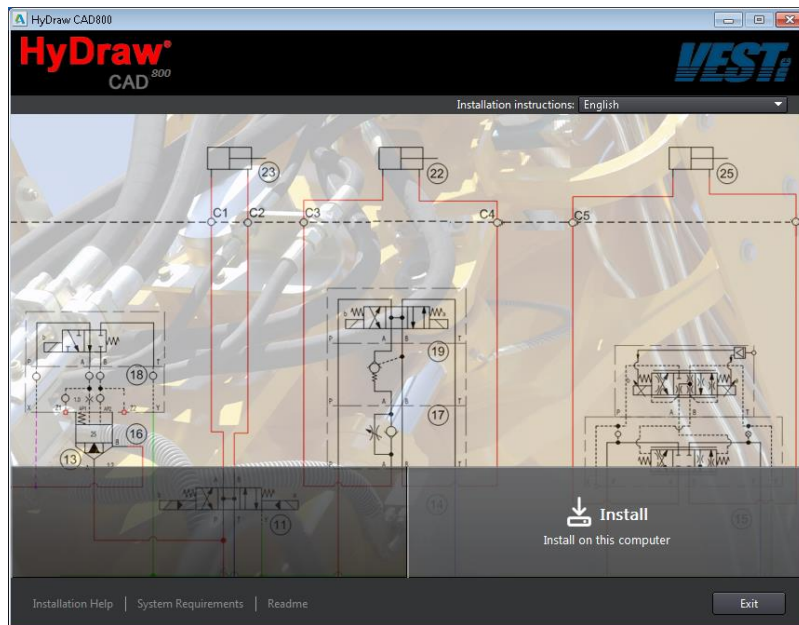
4. After Configuration, click **Configuration Complete**.
5. Click **Install**.

View the HyDraw CAD User Manual and the Read Me file from the Documentation section, if required.

6. Once complete, click **Finish** in the HyDraw CAD⁸⁰⁰ dialog box and restart your computer for the changes to take effect.

HyDraw CAD⁸⁰⁰ and HyDraw Library Manager are installed on the system and HyDraw CAD⁸⁰⁰ is displayed in the Windows Start > Program menu.

A HyDraw CAD⁸⁰⁰ shortcut icon is created on the desktop.



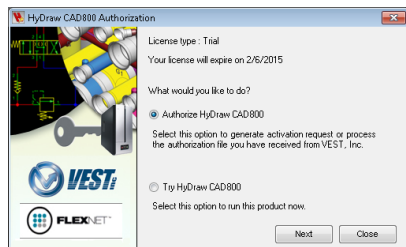
HyDraw CAD Installation screen



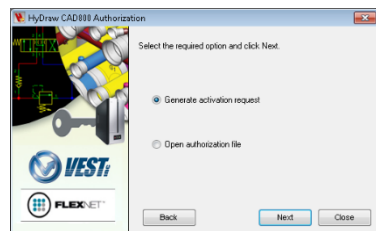
HyDraw800 CAD desktop icon

3. Submit Authorization Request

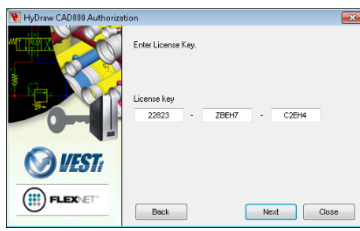
1. Double click the **HyDraw® CAD⁸⁰⁰** desktop icon.
The HyDraw CAD800 Authorization dialog box displays.



4. Select **Authorize HyDraw CAD⁸⁰⁰** or **Try HyDraw CAD⁸⁰⁰** for 30 days trial period.
5. Click **Next**.



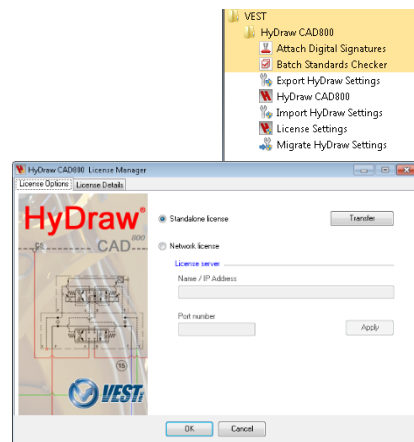
6. Select **Generate activation request**.
7. Click **Next**.



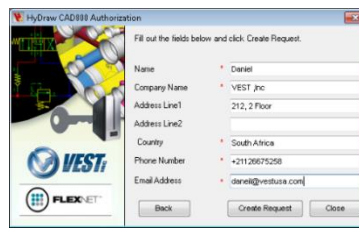
8. Enter the **Serial Number** provided when you purchased the software.
9. Click **Next**.

2. Alternatively select,
Start
> **All Programs**
> **VEST**
> **HyDraw CAD⁸⁰⁰**
> **License Settings**

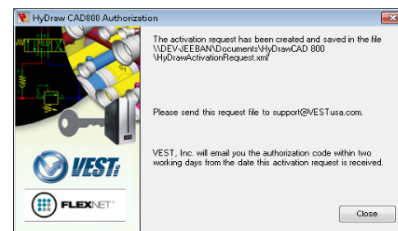
The HyDraw CAD800 License Manager dialog box displays.



3. Click the **Activate** button.
The HyDraw CAD⁸⁰⁰ Authorization dialog box displays.



10. Enter your contact details.
11. Click **Create Request**.

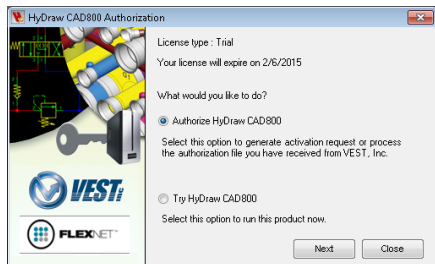


12. Attach the request file to an email and send it to **support@VESTusa.com**.
13. Click **Close**.

Authorization request is generated and prompts to save in an xml file.

4. Authorize HyDraw CAD⁸⁰⁰

1. Double click the **HyDraw[®] CAD⁸⁰⁰** desktop icon.
If the program is not authorized, then the License Server Product Authorization dialog box displays.



2. Select **Authorize HyDraw CAD⁸⁰⁰**.
3. Click **Next**.

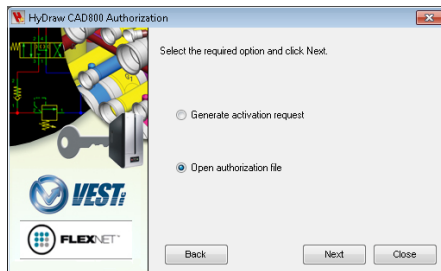
Alternatively select,
Start

- > All Programs
- > VEST
- > HyDraw CAD⁸⁰⁰
- > **License Settings**

The HyDraw CAD⁸⁰⁰ License Manager dialog box displays.

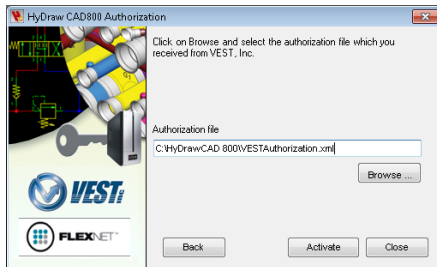
4. Click the **Activate** button.

The HyDraw CAD⁸⁰⁰ Authorization dialog box displays.

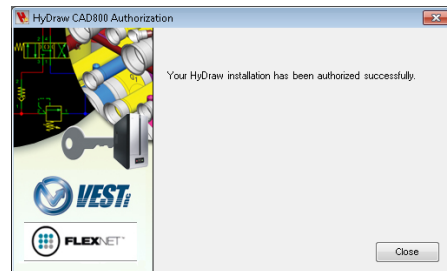


5. Select **Open authorization file**.

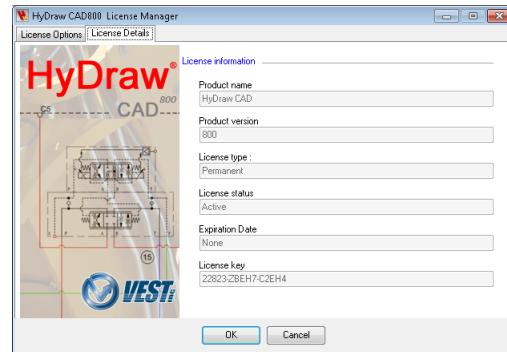
6. Click **Next**.



7. Click **Browse** and select the saved Authorization code XML file.
8. Click **Activate**.



9. Click **Close**.
The dialog box closes and HyDraw License is successfully activated.
10. Check the License details from the HyDraw License Manager.



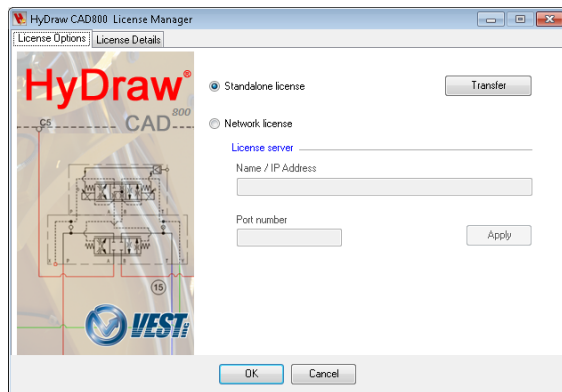
5. Transfer Standalone License

The fully activated Network License has the **Transfer** button to return the software to VEST for deactivation of the software on the current machine and reactivation on a different machine.

Submit Transfer Request

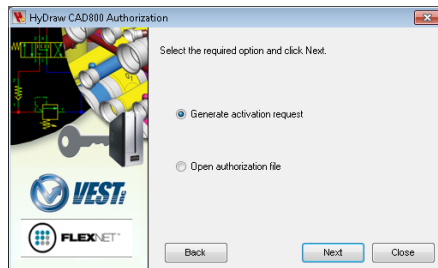
1. Select,
Start
> All Programs
> VEST
> HyDraw CAD⁸⁰⁰
> License Settings

The HyDraw CAD⁸⁰⁰ License Manager dialog box displays.



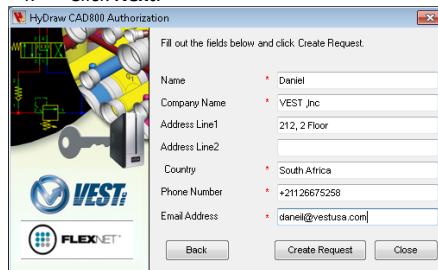
2. Click the **Transfer** button.

The HyDraw CAD⁸⁰⁰ Authorization dialog box displays.



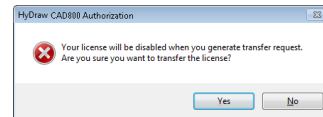
3. Select **Generate transfer request**.

4. Click **Next**.



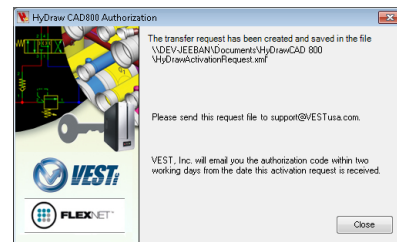
5. Change your contact details, if required.
6. Click **Create Request**.

A warning message appears indicating the license will be disabled.



7. Click **Yes** to continue or **No** to skip the transfer.

Authorization request is generated and prompts to save the xml file.



9. Attach the request file to an email and send it to **support@VESTusa.com**.
10. Click **Close**.

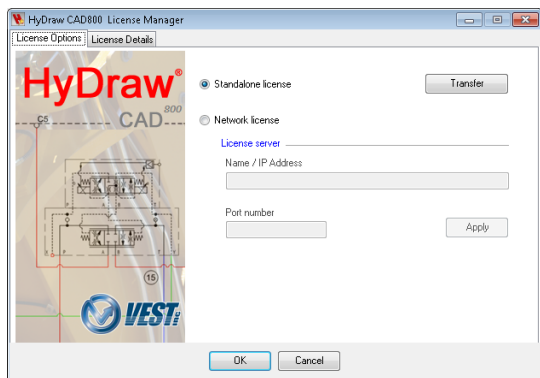
Note:

The transfer process will be completed, only when you activate the authorization file received from VEST.

Authorize Transfer Request

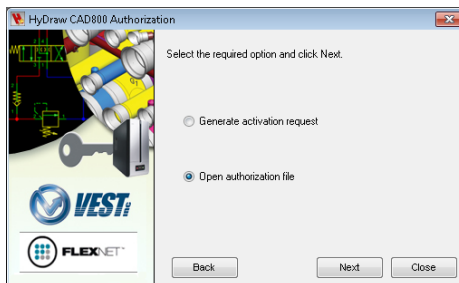
1. Select,
Start
> All Programs
> VEST
> HyDraw CAD⁸⁰⁰
> **License Settings**

The HyDraw[®] CAD800 License Manager dialog box displays.



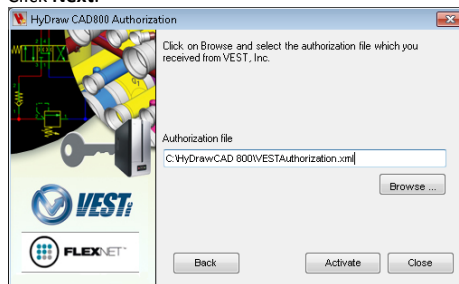
2. Click the **Transfer** button.

The HyDraw CAD⁸⁰⁰ Authorization dialog box displays.

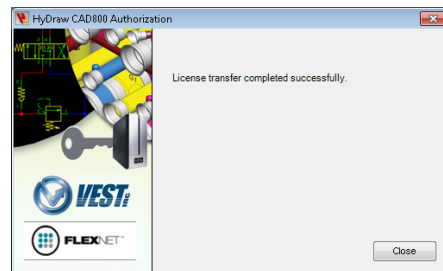


3. Select **Open authorization file**.

4. Click **Next**.



5. Browse and select the saved Authorization code .xml file.
6. Click **Activate**.



7. Click **Close**.
The dialog box closes and HyDraw CAD⁸⁰⁰ License is successfully transferred.

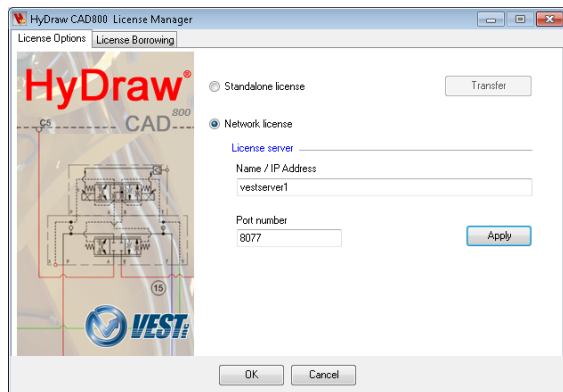
6. Use and Borrow Network License

The HyDraw® client machines can use a network license available from the HyDraw License Server Manager.

Using Network License

1. Select,
Start
> All Programs
> VEST
> HyDraw CAD⁸⁰⁰
> **License Settings**

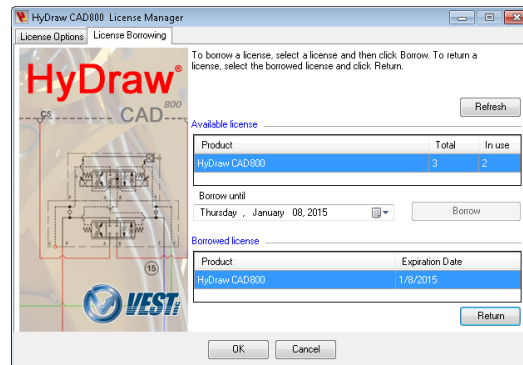
The HyDraw CAD⁸⁰⁰ License Manager Dialog box displays.



2. Select the **Network license** option.
3. Set the License Server Name/IP Address and Port number.
4. Click **Apply**.

Borrowing Network License

1. Select the **License Borrowing** tab.



2. Select the **Borrow until** date.
3. Click the **Borrow** button.

The Borrowed license details are displayed in the grid.

4. Click **OK** to exit.

Return Network License

1. The license can be returned by clicking the **Return** button.
2. Click **OK** to exit.

7. Migrate Settings

Migrate the HyDraw® settings of old version to HyDraw CAD⁸⁰⁰.

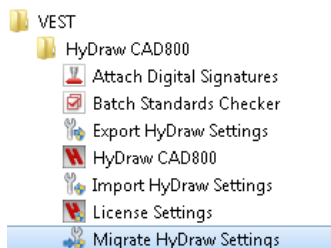
1. Select,
Start
> All Programs
> VEST
> HyDraw CAD⁸⁰⁰
> **Migrate HyDraw Settings**

The HyDraw CAD⁸⁰⁰ Migrate Settings message box displays.

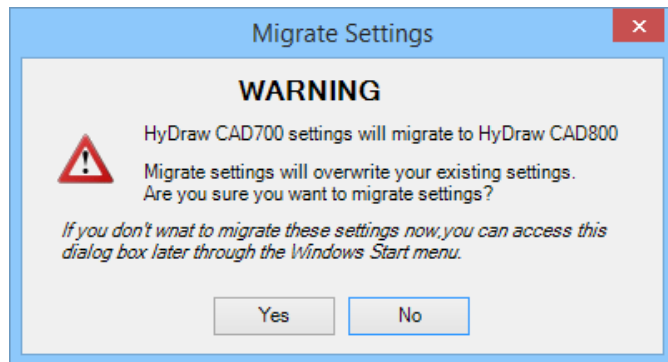
2. Click **Yes** to migrate old version of HyDraw settings to HyDraw CAD⁸⁰⁰ settings.

Note:

Migrate settings will override the existing settings.



Migrate Settings



Migrate Settings Message Box

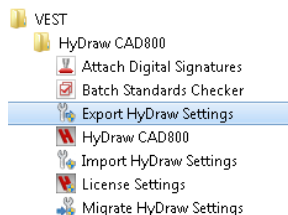
8. Export Settings

Export the existing HyDraw® settings.

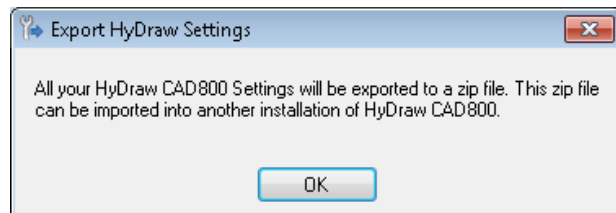
1. Select,
Start
> All Programs
> VEST
> HyDraw CAD⁸⁰⁰
> **Export HyDraw Settings**

The HyDraw CAD⁸⁰⁰ Export message box displays.

2. Click **OK** to open the Browse folder.
3. Select the folder where you want to export all the HyDraw Settings files.
4. Click **OK** to save and exit.



Export Settings



Export Settings Message Box

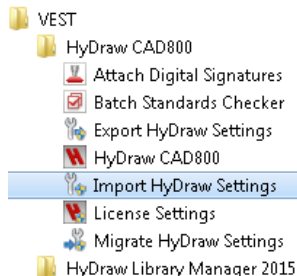
9. Import Settings

Import the HyDraw® settings to the existing HyDraw settings.

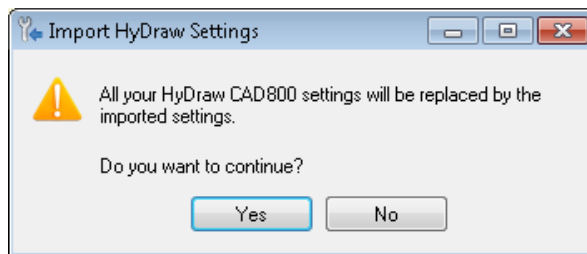
1. Select,
Start
> All Programs
> VEST
> HyDraw CAD⁸⁰⁰
> **Import HyDraw Settings**

The Import HyDraw Settings message box displays.

2. Click **Yes**.
The File Select dialog box displays.
3. Select the HyDraw settings zip file to import.
4. Click **OK** to exit.



Import Settings



Import HyDraw Settings Message box

69. Library Network Configuration

HyDraw® CAD⁸⁰⁰ can access data from the HyDraw library on a local network.

This enables all designers in an organization to work efficiently by sharing a common data resource.

For details on installing the HyDraw Library, refer the Library Manager User Manual.

Library Network Configuration

1. Select Circuit > **Options** from the HyDraw CAD⁸⁰⁰ ribbon menu.

The HyDraw Options dialog box displays.

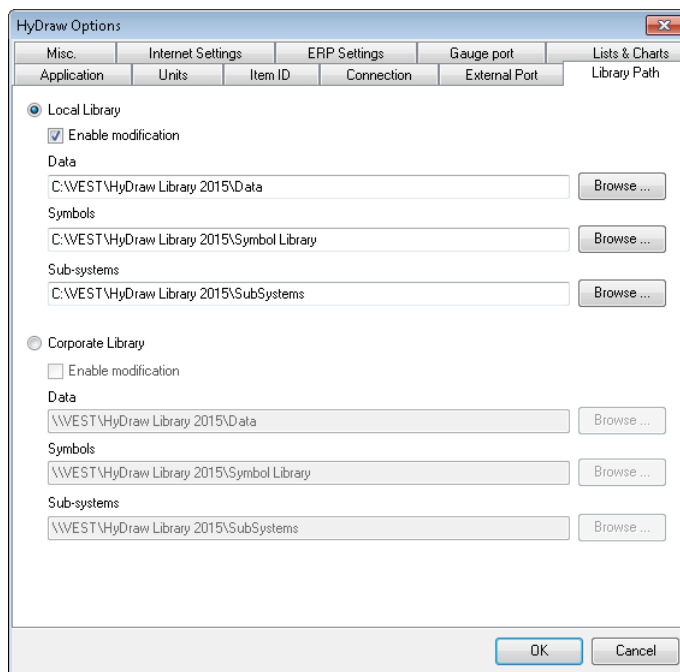
2. Select the **Library Path** tab.
3. Select the **Corporate Library** option.
4. Select **Enable modification**, if you want to modify your library.
5. Click **Browse...**
6. Navigate to the folder, where your HyDraw Library data is installed.
7. Repeat step 2, 3, and 4 for each of the specified HyDraw data paths.
8. Click **OK**.

All HyDraw Library paths are configured as selected.

Note:

All data paths shown are default.

You can configure to common network data paths.



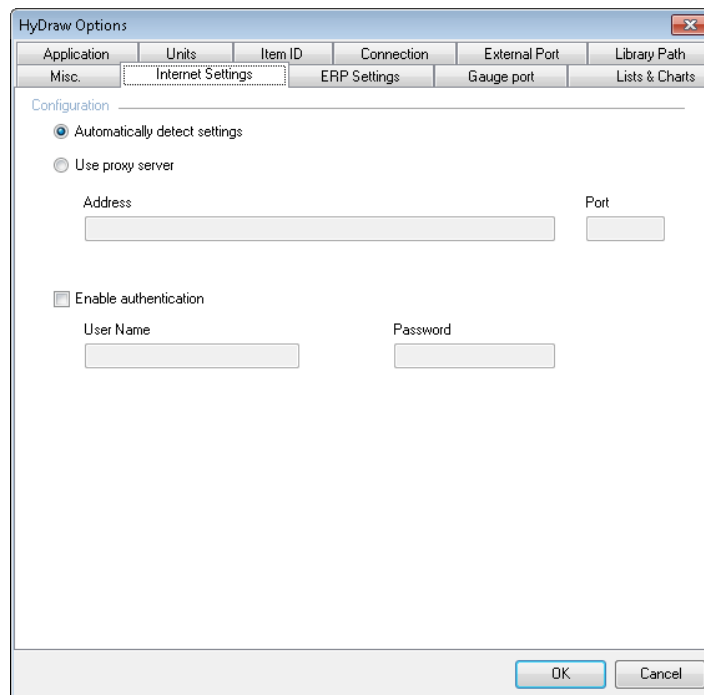
HyDraw CAD library default paths

70.Set Online Services (FPT)

Internet Settings for accessing FluidPowerTools.com

1. Automatically detect settings

If your computer is connected to the Internet through a direct LAN connection, then select the **Automatically detect settings** option.



Connection Settings – Direct Connection

2. Proxy Connection

If your computer is connected to the Internet through a web proxy server, then select Use proxy server.

Configure the proxy settings.

1. Enter the address.
2. Enter the port number.
3. Enter authentication details, if required.

You may refer to the settings that may be already defined in your web browser.

Note:

- If an automatic configuration script is used in the browser for proxy, then use the Proxy server settings from the LAN Settings dialog box in the browser to configure your Proxy Connection settings.
- If you do not find proxy server details in the browser, then contact your system administrator.

The screenshot shows the 'HyDraw Options' dialog box with the 'Internet Settings' tab selected. The 'Configuration' section has two radio buttons: 'Automatically detect settings' and 'Use proxy server'. The 'Use proxy server' option is selected. Below this, there are two text input fields labeled 'Address' and 'Port'. The 'Address' field contains the text 'User'. Below these fields, there is a checked checkbox labeled 'Enable authentication'. Under this checkbox, there are two more text input fields: 'User Name' (containing 'User') and 'Password' (containing a series of asterisks). At the bottom right of the dialog box, there are 'OK' and 'Cancel' buttons. The 'OK' button is highlighted with a red dashed border.

Connection Settings – Proxy Settings

71. Build New Symbols

Create symbols from the building elements supplied along with the library.

1. Build New Symbol

In the HyDraw® Library Explorer, browse to the required folder, where you want to add a new symbol.

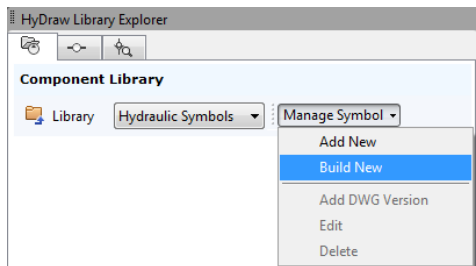
1. Click **Manage Symbol**.
2. Select **Build New** symbol from the drop down.

The Build New Symbol window displays.

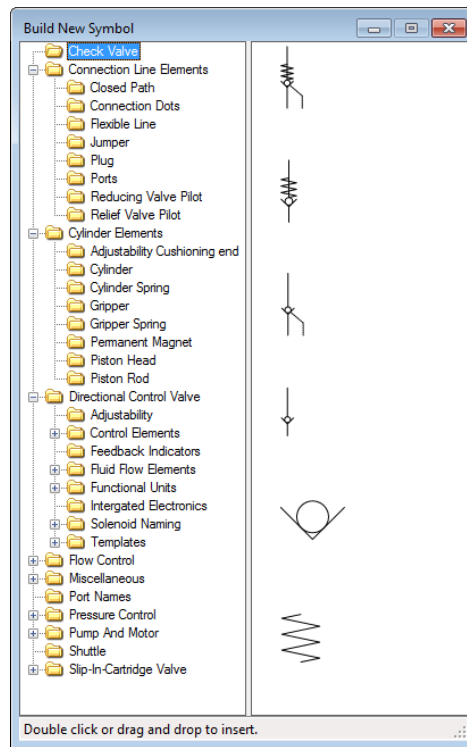
The basic building block elements are structured in logical folders for easy access.

3. Browse to the required folder.

The Basic Building Elements are displayed in the right side window.



Manage Symbol - Build New

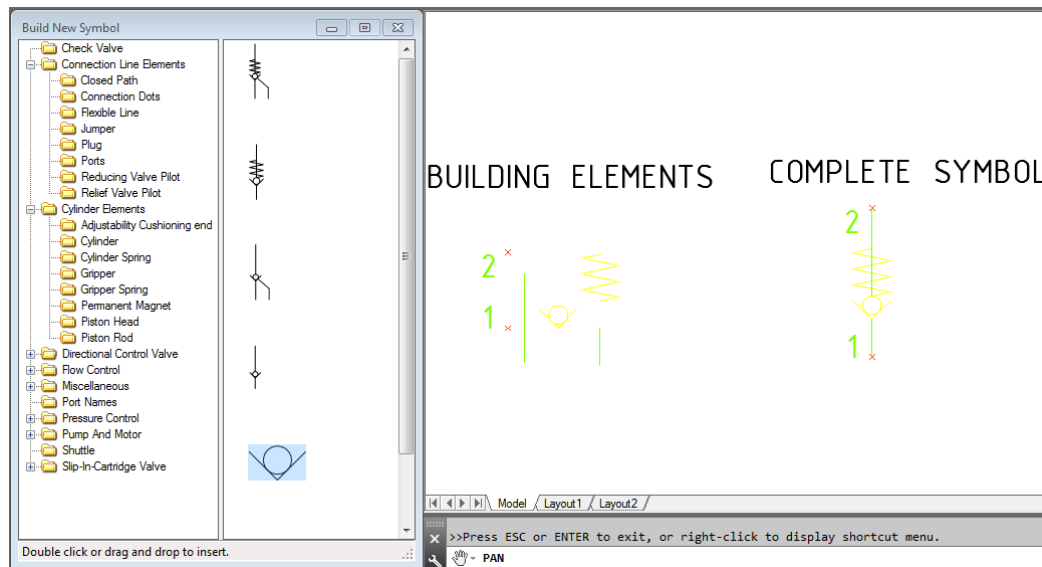


Build New Symbol –Basic Building Elements

4. Double click or drag and drop the basic elements to the drawing space.
5. Position the elements at the right place.
6. Insert the port names from the Port Names folder.

The Port Name symbol consists of a Connection Point and Port Name.

Once your design is complete, select the **Add New Symbol** to bring the newly built symbol into the library.



Basic Building Blocks inserted into the drawing space

2. Add New Symbol

Add newly designed or modified symbol in to the HyDraw® Symbol Library.

In the HyDraw Library Explorer, browse to the required folder, where you want to add a new symbol.

1. Click **Manage Symbol**.
2. Select **Add New Symbol** from the drop down.

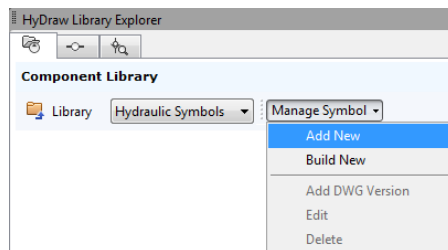
The Add Symbol dialog box displays.

3. Select **Application**.
4. Select **Component Type**.
5. Click **OK**.
6. Select the symbol to be inserted.
7. Specify the Insertion point.
8. Press **Enter/Tab**.

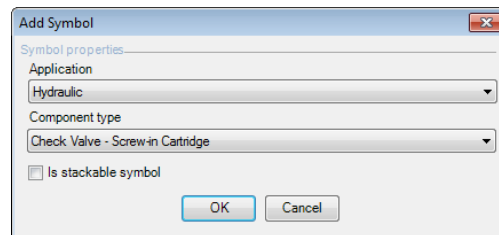
The symbol is inserted into the library.

Note:

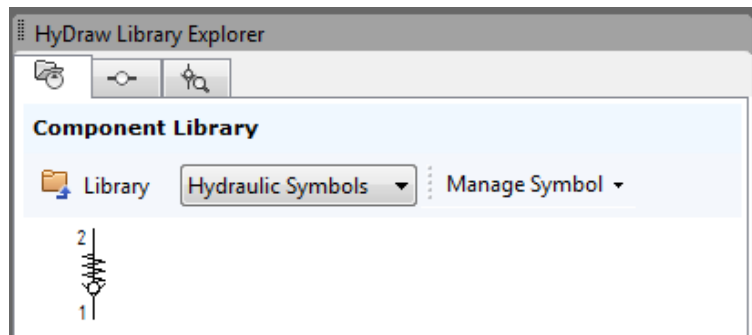
You need to revisit the folder to view the inserted symbol.



Manage Symbol - Add New Symbol



Add Symbol



The New Symbol is added to HyDraw Library

3. Edit Master Symbol

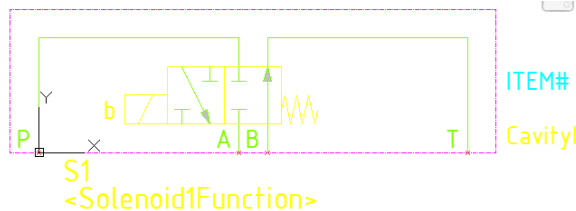
Modify the master symbol available in the HyDraw® Symbol Library.

In the HyDraw Library Explorer, browse to the required folder and select the symbol to edit.

1. Click **Manage Symbol**.
2. Select **Edit Symbol** from the drop down.

The symbol displays on the drawing space along with the Edit Master Symbol dialog box.

3. Edit the symbol.



Edit Master Symbol

1. Edit Port

1. Type the new name in the **Name** column and the optional name in the **Other Name** column.
2. To delete the port, click
3. Select **Name/Other Name** in the Display option.
4. Click **OK**.

The Name/Other name of the port displays with the symbol,

If both the names are selected, then dual port names are displayed.

2. Insert Port

1. Type the new name in the **Name** column and the optional name in the **Other Name** column.
2. Click **Insert** and insert the port on the symbol.
3. Specify the port insertion point.

The Edit Master Symbol dialog box reappears after the port insertion.

The screenshot shows the 'Edit Master Symbol' dialog box. It has several sections: 'Edit port' with a table, 'Insert port', 'Display formats', 'Solenoid information', and 'Display'.





Name	Other Name	
P	1	
A	2	
B	4	
T	3	

The 'Display' section has checkboxes for 'Name' (checked) and 'Other Name' (unchecked).

The 'Solenoid information' section has fields for 'Solenoid b' (S1) and 'Solenoid2' (empty), with an 'Update' button.

Edit Master Symbol

3. Display Formats

1. Click  to add the new display format.
2. Click  to rotate right.
3. Click  to rotate left.
4. To delete the earlier display format, click .

4. Solenoid Information

1. Enter the Solenoid ID.
2. Click **Update** to display the Solenoid ID on the drawing.
3. Click **OK**.

The modified symbol is updated in the library.

Note

- You need to revisit the folder to view the changes of the modified symbol.
- Click the Building Blocks to insert the basic building elements from the Building Blocks window.

5. Delete Symbol

Delete Symbol command enables you to *delete the master symbol available in the HyDraw® Symbol Library*.

Caution:

The symbol once deleted, is permanently removed from the library and cannot be brought back.

6. Add DWG Symbol

Add DWG Symbol enables you to add DWG symbol to the HyDraw Symbol Library.

Note:

- The HyDraw Library Manager consists of both Visio and CAD symbols.
- The Add DWG Symbol is enabled, only when Visio symbol exists in the HyDraw Symbol Library and CAD symbol does not exist.

72. Build New External Ports

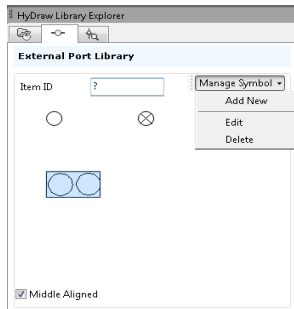
Create custom external ports from the building elements supplied along with the library.

1. Add New External Ports

Add newly designed or modified external ports into the HyDraw® Symbol Library.

1. In the External Port Library of HyDraw Library Explorer, browse to the required folder, where you want to add a new symbol.
2. Click **Manage Symbol**.
3. Select **Add New** from the drop down.
4. Select the symbol to be inserted.
5. Specify the Insertion point.
6. Press **Enter/Tab**.

The symbol is inserted into the library.



Manage Symbol > Add New Symbol

Note:

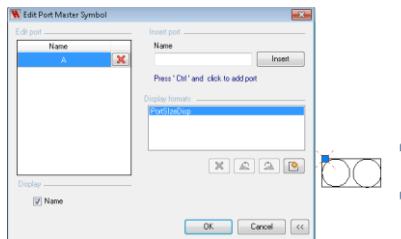
The symbols should have minimum of one connection point.

2. Edit External Port Symbol

1. In the External Port Library select the symbol to edit.
2. Click **Manage Symbol**.
3. Select **Edit** from the drop down or Right click and select Edit.


The symbol displays on the drawing space along with the Edit Master Symbol dialog box.

4. Edit the symbol.



Edit Port Master Symbol

1. Edit Port

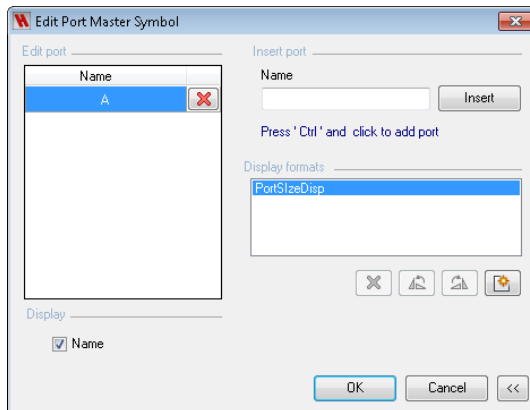
1. Type the new name in the **Name** column.
2. To delete the port, click .
3. Select **Name** in the Display option.
4. Click **OK**.

The Name of the port displays with the symbol.

2. Insert Port





1. Type the new name in the **Name** column.
2. Click **Insert** and insert the port on the symbol.
3. Specify the port insertion point.

The Edit Port Master Symbol dialog box reappears after the port insertion.



Edit Port Master Symbol dialog box

3. Display Formats

1. Click  to add the new display format.
2. Click  to rotate right.
3. Click  to rotate left.
4. To delete the earlier display format, click .

Delete Symbol

The Delete Symbol command enables you to delete the master symbol available in the HyDraw® Symbol Library.

Caution:

The symbol once deleted, is permanently removed from the library and cannot be brought back.

A

About HyDraw, 137
Accessories, 77
Actuation Chart, 25
Add New Display Format, 108
Add New Symbol, 154, 158
Align External Port Names, 93
Align Symbol Ports, 92
Align Symbols, 89
Annotations, 102
Application, 15
Authorize HyDraw CAD⁷⁰⁰, 142

B

Build New External Ports, 158
Build New Symbols, 152

C

Calculator, 124
Change Text Height, 103
Collate CAD Files, 123
Collate Documents, 122
Collate Files, 121
Command options, 33
Component Data Available, 131
Components, 77
Configure External Port, 45
Connect Ports and Symbols, 63
Connection Tab, 36

Contact Info, 133
Copy Properties, 79
Create and Insert Net List, 118, 120
Create and Insert Parts List, 110
Create and Insert Ports List, 113, 115
Create Solenoid Actuation Chart, 117

D

Data Access Settings, 129
Delete a Symbol, 96
Design Notes, 27
Design Requirements, 70
Dock HyDraw Property Manager, 11

E

Edit Design Notes, 100
Edit in Place, 95
Edit Master Symbol, 155, 159
Edit Properties, 78
Edit Solenoid Information, 101
Edit Symbol Port, 94
Envelop Line, 30
Envelopes, 77
ERP Interface, 86
ERP Settings, 35
Export Settings, 147
Export to MDTools, 127
External Port, 18
External Ports, 77

F

Fetch Pipe and Tube Data, 64
Fetch Port data from Library, 42, 44
Flip Symbols, 91

G

Gauge Port, 38

H

Help, 135, 136
Help for FluidPowerTools.com, 130
Hose List, 21
HyDraw CAD Ribbon Menu, 6
HyDraw Library Explorer, 7
HyDraw Options, 15
HyDraw Property Manager, 10
HyDraw Startup, 5

I

Import Settings, 148
Insert Connection, 62
Insert Envelope, 59, 60
Insert External Port, 43
Insert from Parts List, 56
Insert Ports List, 113, 115
Insert Symbol, 40
Insert Symbol Port, 58

Insert Symbols, 39
Insert Terminators, 57
Installation, 139
Installation & Setup, 138
Internet Setting, 134
Internet Settings, 34
Introduction, 1
Item ID, 37

L

Library Network Configuration, 149
Library Path, 28
Lists, 109
Lists & Charts, 19
Load HyDraw Property Manager, 14
Load on startup, 30

M

Make Connections, 61
Match Connections, 67
MDTools Interface, 126
Misc., 29
Model Data, 71
Move Symbol, 88

N

Net List, 26

O

Online Services, 150
Open HyDraw Property Manager, 11

P

Parts List, 19
Ports List, 23
Proxy Connections, 151
Purge Price Data, 85
Purge Property, 83

R

Reassign Hose ID, 106
Recreate Balloons, 107
Refresh Properties, 80
Reset Connections, 68
Resign Item ID, 105
Rotate Property Text, 104
Rotate Symbols, 90

S

Search Components, 46
Search Sub-systems, 52
Selected Item, 12
Selected Item Properties, 70
Show/Hide Design Notes, 99
Show/Hide Port Name, 98
Show/Hide Properties, 82

Software Installation, 140
Solenoid Naming, 32
Specify Properties, 69
Stack Symbols, 97
Stretch Connections, 66
Submit Authorization Request, 141
Subscription Information, 130
Support, 3
Symbol, 70
Symbol Color, 31
System Properties, 77
System Requirements, 139
System tab, 13

T

Terms of Usage, 132
Text Size, 29
Transfer Standalone License, 143

U

Unit Converter, 125
Units, 16
Update Property List, 81
Use and Borrow Network License, 145, 146
User Manual, 3

W

Workspace, 4

HyDraw® → MDTools®



VEST, Inc.
3250 W. Big Beaver Rd., #440
Troy, MI 48084 USA

Call: +1 (248) 649-9550
Email: sales@VESTusa.com
Visit: VESTusa.com

© 2015, VEST, Inc.
All rights reserved.